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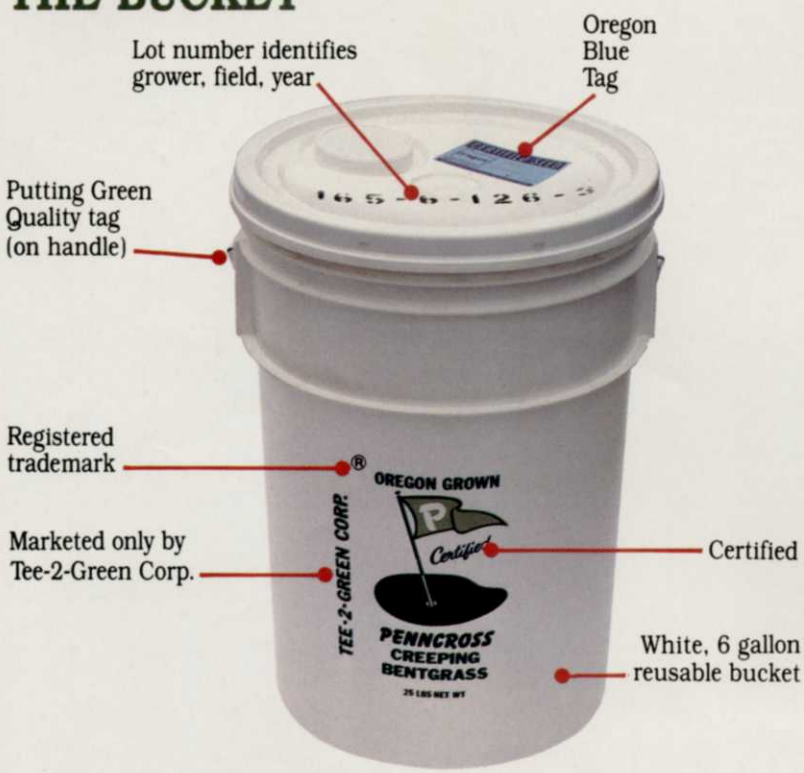

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On the cover: Putters on a bentgrass green, by Larry Kassell

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Bacteria strain toxic to *poa* discovered

■ Michigan State University plant pathologist David Roberts has discovered a strain of the bacteria Xanthomonas that is toxic to annual bluegrass, while harmless to other plants, animals and humans. So far, he has done most of his testing in the laboratory and greenhouse, with excellent results, he says. This summer marked the first time he field tested the bacterium. Results, he says, are mixed because of a lack of environmental control available in the lab. However, Roberts adds, "It's shown very good herbicidal activity in the field."

Roberts applied for a patent on the selective herbicidal bacterium about a year ago and as of August hadn't received the patent, often a time-consuming process. A number of people have volunteered sites to test the bacterium in various parts of the country but he has yet to make a decision on where further tests will take place. He also is taking offers from chemical companies to develop and market the bacterium once he receives the patent and obtains EPA approval for use.

A seed glut by 1990?

■ The factors seem to be in place. The housing market is slowing, slowing demand. But according to Barry K. Green II, vice president of Jonathan Green, 15,000 additional acres of bluegrass crop were planted by the industry in 1986. "More acreage was planted last year that won't yield this year. Next year it will yield."(Bluegrass fields take two years to produce seed.)

Combine this with the increased popularity and acreage of turf type tall fescues and the new dwarfs of these, plus more perennial ryegrass, and there could be "something of a glut" next year, Green says. In addition, he says researchers in Oregon are developing bluegrass varieties that yield exceptionally well. Green was informed by Rutgers University breeder C. Reed Funk, Ph.D., that upwards of 50 percent of improved bluegrasses in the field can be sterile, unable to reproduce, bringing yields down. The new bluegrasses, now in the first generation of development, will have a wider genetic window with a greater potential for pollination. Green expects the second generation of these new breeds to hit the market by the end of the decade as well. More seed. As a result, he sees the day when sod blend bluegrass seed will actually drop near or below $2 a pound.

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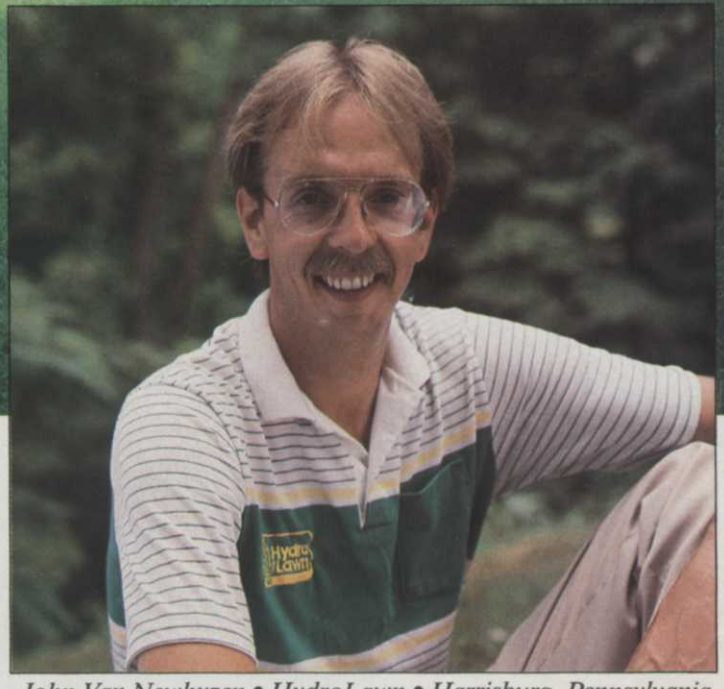

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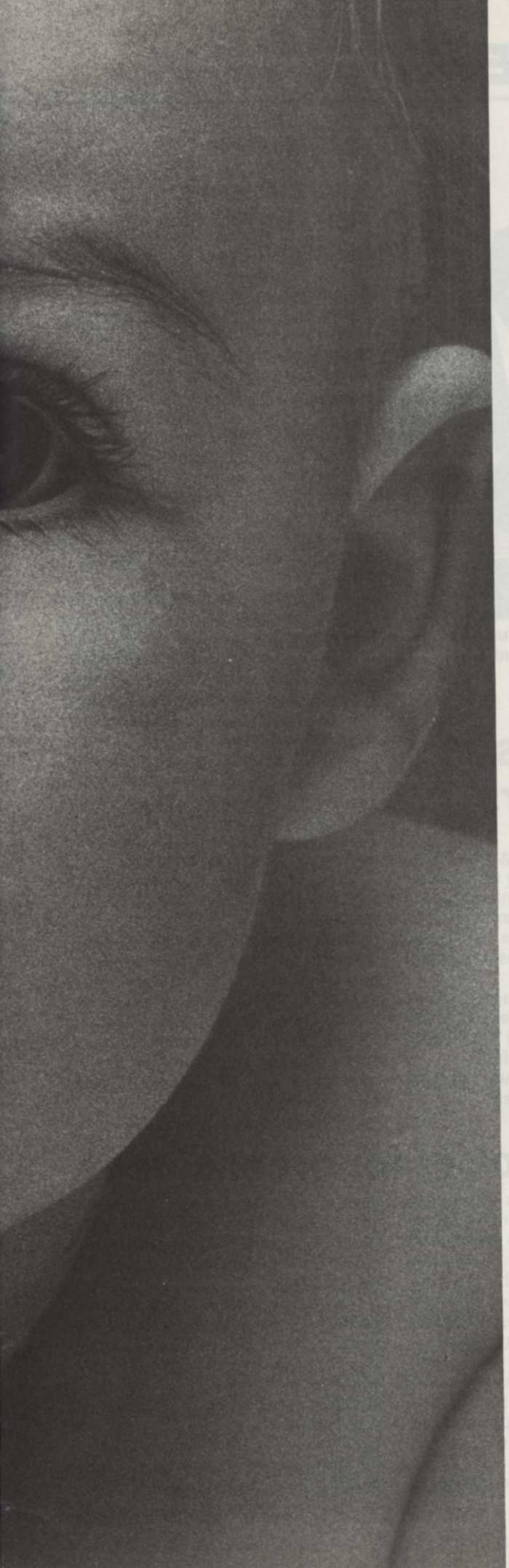

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Bob Peterson (right) and Eliot Roberts talk over current affairs during a board session of The Lawn Institute. Peterson is 1987-88 president and Roberts executive director.

ASSOCIATIONS

The Lawn Institute chooses 1987-88 officers, directors

Bob Peterson of R.J. Peterson Enterprises, Hillsboro, Ore., will be president of The Better Lawn and Turf Institute during 1987-88. Peterson was chosen during the institute's annual meeting in conjunction with the 104th American Seed Trade Association convention in Boston.

Also chosen for seats on the board of directors were Howard Schuler of Northrup King, Doyle Jacklin of Jacklin Seed, Harry Stalford of International Seeds, Bob Russell of J&L Adikes and Norman Rothwell of Rothwell Seeds.

During the meeting, a moment of silence was observed in remembrance of Robert Schery, Ph.D., a former executive director of the Lawn Institute, who passed away late last year.

Current executive director Eliot Roberts, Ph.D., also announced:

- the institute will increase press kit mailings from two to four per year;
- the institute will not include wildflowers in its Variety Review Board cultivars;
- a more assertive posture on the benefits of turfgrasses will be presented during 1987-88; and
- it remains undecided whether the Lawn Institute will begin granting funds for scholarships.

At the annual meeting, considerable discussion took place on whether to begin research on permanent weed tolerances in seed, as Pennsylvania, Maryland and Virginia are three states that require noxious weed label tolerances.

Later in the proceedings, C. Reed Funk, Ph.D., told attendees that another National Turf-Type Tall Fescue Test is being seeded this fall.

Next year's ASTA Lawn Division meeting is in Seattle, Wash.

INDUSTRY

Rhone-Poulenc reorganizes Chipco

The Chipco/Specialty Products Group of Rhone-Poulenc has completed a reorganization of its sales, marketing and product development staff. The move was made to increase the group's presence in the turf, landscape and ornamental markets. The reorganization is a result of the company's acquisition of Union Carbide Agricultural Products last year.

The acquisition added Sevin SL carbaryl insecticide, Temik 10G aldicarb pesticide, Florel plant growth regulator, Weedone DPC and DPC Amine and Rootone rooting hormone to the Chipco/Specialty Products Line.

Dan Stahl, business manager for Chipco Specialty Products will now be responsible for these products. He previously served in that capacity for Chipco's 26019 and Aliette fungicides, Ronstar and Turfkleen herbicides, Mocap insecticide and Microgreen nutrient additive.

Within product development, P. Chris Kleyla was named product development manager. Elizabeth A. Brown, Tom C. Davidson and Tom E. Vrabel join the product development staff as program coordinators.

John W. Durfee and Andrew M. Seckinger have been named product managers.

Dick Lehman, director of sales-specialty for Rhone-Poulenc, says the new alignment will facilitate future expansion. "The addition of several former Union Carbide products to the Chipco product line promises to increase the utility of the line to turf, landscape and ornamental managers," he says.

PESTICIDES

Cadmium okay for greens, tees

The only exception to an order banning cadmium allows use of cadmium fungicides on golf course greens and tees under certain circumstances. The use of cadmium in the environment was prohibited under a federal regulation announced Aug. 10 by the Environmental Protection Agency.

Specifically, cadmium use will be allowed on greens and tees only with a "mini-boom" sprayer, and applicators must wear protective clothing during mixing, loading and application of the product.

Homeowners, turfgrass managers and other users of cadmium fungicides will be forced to seek alternative materials. Neither is cadmium use on fairways and other golf course areas allowed.

The decision to exempt golf course greens and tees was made in part because of information received at the EPA through the Golf Course Superintendents Association of America's Government Relations Program. In May, members of the EPA review team were given a demonstration of the "mini-boom" sprayer at the Congressional C.C. in Bethesda, Md.

SHORT CUTS

LEGISLATION

Blower controversy stirring up the air

California's landscaping industry is beginning to organize against legislative threats that would ban the use of leaf blowers because of "excessive" noise levels. Some communities in the state already have banned their use.

The efforts seem to be paying off in the form of compromises with community leaders. Two hundred contractors attended a Palo Alto City Council meeting to protest proposed anti-blower legislation. This, in addition to postcards and petitions, has forced the council to consider at 9 a.m.-to-5 p.m. use restriction and an 82-decibel noise limit instead of outright banning.

Banning the use of blowers would raise monthly landscaping bills in the city of Belvedere from $200 to $250-260.

Other restrictions would limit decibel levels on blowers to under 80, while limiting use of machines in the 80 to 90 db range to 15 minutes or less at a time.

The restrictions are prompting some companies, such as Echo, to produce quieter blowers. Echo claims to have the quietest on the market, producing 70 db at 50 feet.

However, extensive modifications to blower design seem unlikely since the design is already relatively simple, according to engineers at Echo.

The company has also initiated a user education program.

REFERENCE

Book published for 'green' businesses

John R. Beck, one of the nation's top business advisors to the lawn care and pest control industries, has published "Managing Service for Success."

The book includes business management advice from a team of experts like former National Pest Control Association president Hal Stein and public relations counselor Alan Caruba. Topics covered are working relationships with banks, attorneys and accountants; public relations and advertising; new technology; personnel and more.

Send your name, address and $25 plus $3 postage and handling to: International Pest Management Consultants, 3631 W. Pasadena, Phoenix, AZ 85019.

NOT EVEN 'HEAVY DEW'... They say it never rains in California. This summer, "they" were pretty near right. "We had our worst drought in 10 years," Janet Hartin tells LANDSCAPE MANAGEMENT. Hartin, a cooperative extension agent in San Bernardino County, says that sun-scorched leaves on trees and ornamentals were a big problem. "Low-lying fog and cool valley temperatures caused people to water less than when it's intensively hot. That resulted in a lot of physiological wilt," she notes. Not unlike much of the rest of the country, the dry summer took its toll on Southern California's plants.

AND IT COULD BE WORSE... More work must be done on salt-tolerant grasses, says the president of the Southern California chapter of the GCSAA. The water shortage there could reach epic proportions. "We need snow this winter, or it's water rationing next year," notes Don Parsons of Old Ranch Country Club, Seal Beach, Calif. "In the northern part of the state, the lakes are as low as they were 10 years ago." Parsons thinks there will be a big technological push toward saline and effluent water for irrigation, as reported in the July issue of LM.

WARM BODIES NEEDED...LM technical advisor Doug Chapman of Dow Gardens, Midland, Mich., notes some statistics that cause him concern about the future of the green industry: fewer high school graduates are choosing horticultural-related fields as a major in college. Purdue, for instance, has 80 students enrolled in horticultural-related studies this year, down from 300 in the 1970s. "There have always been college programs for landscape maintenance," Chapman says. "But we still don't have any for landscape *management*. We don't have the status attached to our profession. We need to have programs in colleges for landscape *management*, and we have to *call* them that."

LOCATION UNKNOWN... Kathleen Colbert of the American Sod Producers Association points out that in the August issue of LM the location of Olympia Fields Country Club was not given. Appropriately enough, the course is in Olympia Fields, Ill., just south of Chicago. Colbert also tells us that ASPA has a new address: 1855-A Hicks Rd., Rolling Meadows, IL 60008; (312) 705-9898.

NEW HAZARDS ON THE COURSE... The nine-hole Laurens (Iowa) Golf and Country Club presents a new hazard to the game of golf. It seems the Laurens Airport is not merely adjacent to the course, it *is* the course. The grass airstrip, which serves private pilots and crop dusters, runs across the rough or fairway on seven of the holes. "The planes have the right of way," Neil Maurer, a charter member of the club, told the *Wall Street Journal*. No kidding. Who's going to stand in the way of a plane? You'd be surprised. Pilots usually circle the field and buzz the course once to clear the runway. However, uninitiated out-of-towners have a tendency to wave back and keep on playing. But they usually figure it out in time to avoid a penalty stroke, among other things.

GIN *from page 9*

BUSINESS

No more illegal aliens in the green industry

If you haven't yet, you had better change your hiring policies now, before it's too late. As of June 1, 1988, all employers—including those in the green industry—face fines and possible prison terms for failure to comply with the new Immigration Reform and Control Act.

"The law isn't just for seasonal farm workers," says Charles D. Covey, Ph.D., of the University of Florida. "Everyone who hires anyone—even for one day—is subject to this new law."

Even if employers personally know for certain that an employee is an American citizen, that person's citizenship or right to work in the U.S. must be verified, Covey emphasizes.

Penalties can range from $250 to $10,000 and imprisonment for each instance of "knowingly hiring" an illegal alien, and $100 to $1,000 for paperwork failures, even in connection with the employment of a legal U.S. citizen, Covey notes.

The law requires all employers to verify the legal status of every employee hired after Nov. 6, 1986. Employees on the payroll prior to this date will be "grandfathered in" and will not have to document their legal work status. The law further requires all employers to sign and retain a form stating what documents have been examined. It says that employees must sign the same form certifying that they are legally eligible to work in this country.

To protect themselves, employers should make copies of documents shown to prove citizenship or the right to work in this country.

Beginning June 1, 1988, the full provisions of the law will be in effect for all employers except those engaged in "seasonal agricultural services" who are exempt from civil money penalties until Dec. 1, 1988. Until next June 1, citations will be issued for the first offense; citations and fines will be issued for additional violations.

PESTICIDES

EPA asked to seek more tests for 2,4-D

The Environmental Protection Agency has been asked to continue testing the herbicide 2,4-D for any possible cancer-causing properties.

The agency's Scientific Advisory Panel recommended an interim Category D classification, meaning the compound is not classifiable by carcinogencity, or cancer-causing capacity.

The agency gave the compound an interim Category C classification in June after examining available literature. Category C means the compound is a possible human carcinogen with limited, inconclusive evidence of animal carcinogenicity.

The Scientific Advisory Panel, reviewing the EPA's work, called for an additional long-term carcinogencity study in rats exposed to 2,4-D. The agency is considering the recommendation.

Meanwhile, EPA is awaiting the results of another study by the National Cancer Institute, says Steve Johnson, executive secretary of the Scientific Advisory Panel. That study is comparing a population of people who have been exposed to the herbicide with one that has not.

Johnson did not think a permanent classification would be announced in the near future. If the agency decides to sanction the recommended rat-feeding study, a classification will be two-and-a-half years away at minimum, he says.

Representatives of the 2,4-D Industry Task Force, a coalition of 2,4-D manufacturers, recommended a Category E Classification—inadequate evidence of carcinogenicity.

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Overseeder II Mix	Fairways, tees, athletic fields.	Rapid germination and establishment. Withstands heavy traffic and resists diseases. Penetrates compacted soils.
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Premium Sod Blend	Commercial sod production.	Exceptional dark green color. Tolerates light shade. Superior disease resistance. Rapid sod producer.
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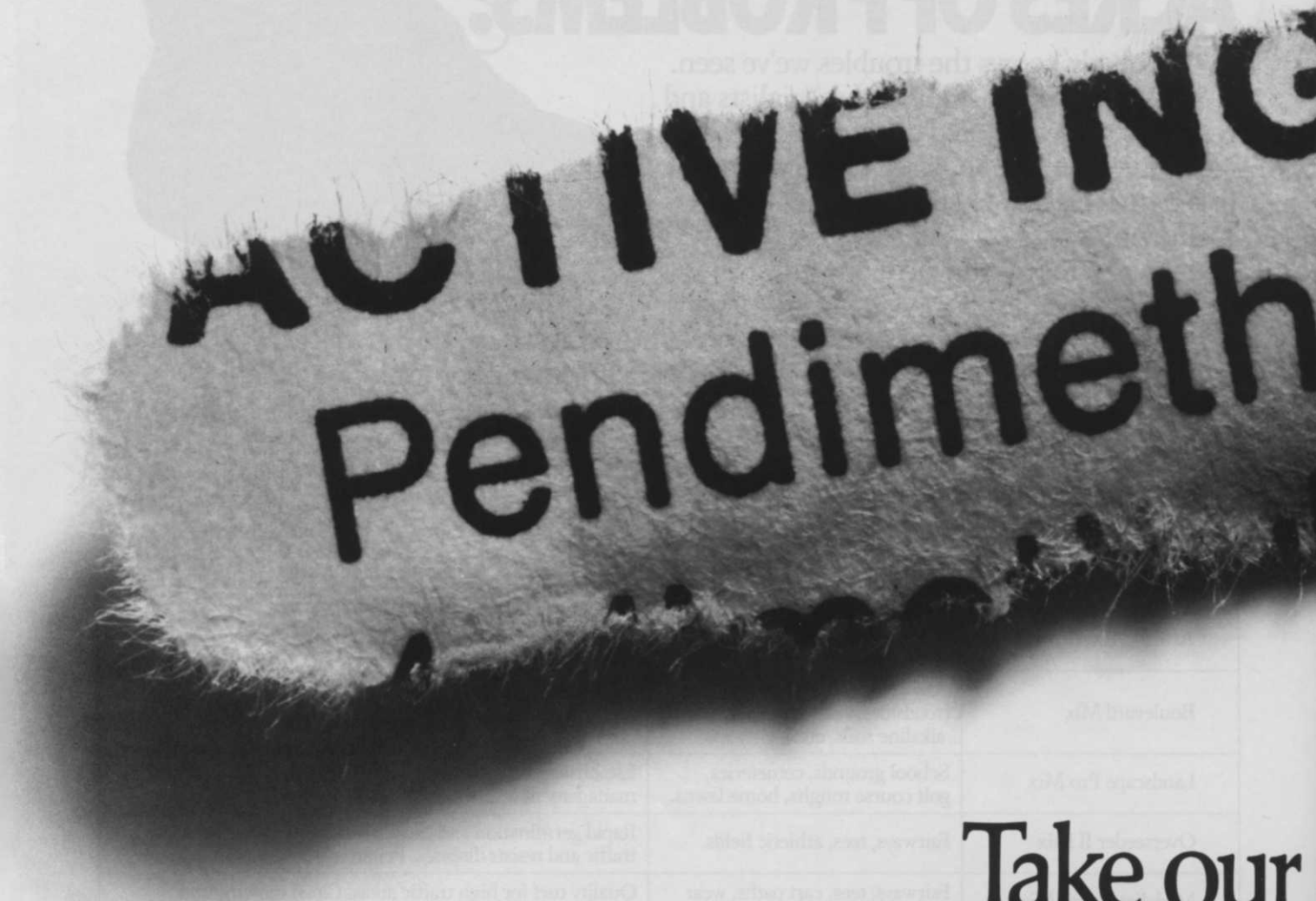
The most effective crabgrass



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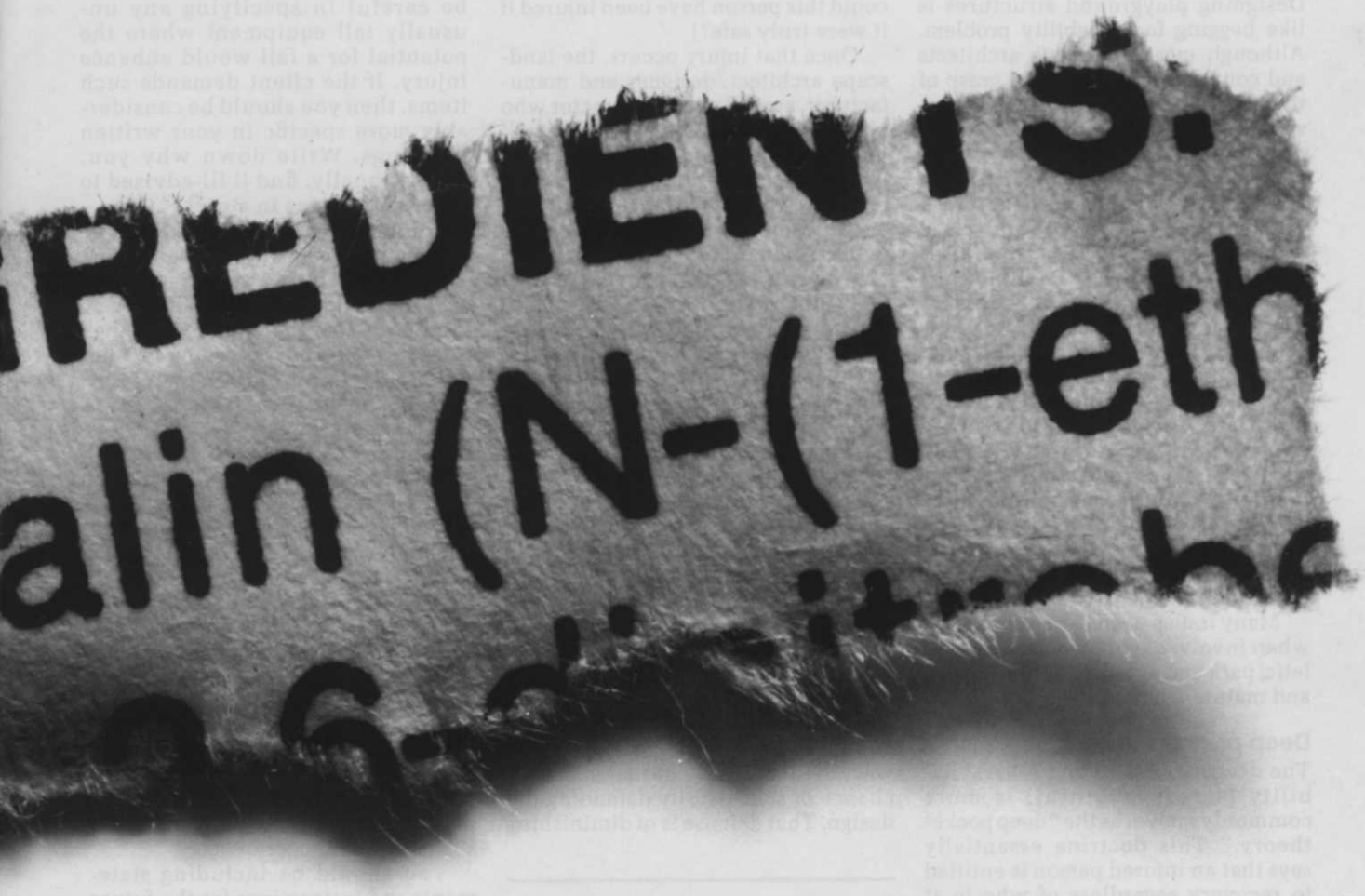
Labels of your best pre-emergent crabgrass and goosegrass herbicides have one thing in common. And it can be summed up in a word: *pendimethalin*.

That's because pendimethalin from American Cyanamid is the active ingredient that offers season-long crabgrass and goosegrass control in both warm and cool season turf grasses. And it does it very economically.

But pendimethalin controls more than just crabgrass and goosegrass. One low rate also prevents other tough grassy weeds including foxtail, fall panicum, barnyardgrass and *Poa*

and goosegrass control.



word for it.

annua. Hard-to-control broadleaf species like oxalis and spurge are also eliminated with the same rate.

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INSURANCE INSIGHTS

Playground design without all the lawsuits

by James Leatzow

Designing playground structures is like begging for a liability problem. Although most landscape architects and contractors have a good grasp of the potential for a major claim resulting from playground work, misunderstandings still exist. Work needs to be done to avoid major litigation concerning playground accidents.

One type of equipment landscapers use is "off-the-shelf" designs. These are sufficient for most playground work done by landscape contractors and architects. The landscaper simply has to specify which equipment would be appropriate. Unfortunately, liability exposure does not stop when the landscaper merely specifies equipment. Recommending equipment is still "professional" exposure (versus a general liability exposure) because it is based on a professional opinion.

Many issues need to be considered when involved with playground, athletic, park and even sports field design and maintenance.

Deep pocket theory

The doctrine of joint and several liability (a real mouthful) is more commonly known as the "deep pocket theory." This doctrine essentially says that an injured person is entitled to recovery regardless of who is at fault. It is possible, therefore, for an injured person to collect from some design professional who may not have had much responsibility for the error that caused the injury, damage or death.

The public has complained most about the deep pocket theory because of what appears to be abuse in many cases. Landscape contractors and architects should investigate the status of joint and several liability in their own state so that they truly understand the potential for their exposures.

Blaming the design

Most lawsuits involving playground situations will try to prove that a faulty design existed. Even if the design appears to be safe by common standards, after a person—usually a child—is injured, the injured party (plaintiff) will try to show that the design was in fact not safe. (How else could this person have been injured if it were truly safe?)

Once that injury occurs, the landscape architect/designer and manufacturer, as well as the contractor who physically built the playground, will inevitably be called into such a case. Under that scenario, the design professional will have to prove that everything done on that design fell within standards commonly accepted for this type of setting.

To defend himself, the manufacturer will have to show that the equipment design was safe. The landscape architect will have to prove that the same equipment has been used without problem in similar applications and is appropriate for the particular project. For example, you wouldn't place a 10-foot tall slide in a tot lot. The landscape contractor (as the installer) will have to show that the design and equipment were properly installed according to the design/plan and manufacturers' instructions.

Equipment misuse

Children often get hurt by misusing equipment. If an adult gets hurt this way, the landscaper has an excellent chance of successfully defending the design. That defense is of diminishing value, however, with children. In my experience, most courts hold the injured child responsible for their own actions to a limited degree after about age 12. Any younger than that and you can usually count on the court finding the child not responsible for the use of such equipment.

You have to 'idiot-proof' your designs by figuring out how equipment might be misused by children.

Get it in writing

What does this mean to you? It means you have to "idiot-proof" your designs (the best you can) by figuring out how equipment might be misused by children. You should be careful in specifying any unusually tall equipment where the potential for a fall would enhance injury. If the client demands such items, then you should be considerably more specific in your written warnings. Write down why you, professionally, find it ill-advised to place such items in a park.

If a client still decides to go forward with an item against your recommendation, then it would be appropriate to have that client sign a statement. It should say that they understand that the decision is not according to your professional opinion of a safe play area. Documentation in all designs is the key to avoiding needless litigation.

If your client changes any aspect of the design, you need to confirm any and all changes in writing. You need not use an attorney for all mundane correspondence. A simple letter stating, "per your instructions, I have made the following changes...I shall assume this is your understanding of the changes as well, unless you notify me otherwise," will work.

Equipment maintenance

The last area to cover is emerging as the newest and most likely target for playground safety litigation. That issue is maintenance.

You should be including statements and instructions for the future maintenance of any soft cushioning material, including replacement. You should also be including specific detail concerning maintenance on the equipment itself such as frequency of checking for missing nuts, bolts, sharp edges, protruding cement and general condition.

In these difficult times, it seems as though everyone is suing everyone for even the most minor situations. By careful thought, documentation, and a large dose of common sense, you can typically avoid being named in the absurd suits. And you will stand an excellent chance of successfully defending yourself in those actions with some merit, assuming you did not, in fact, err.

Good luck and don't get discouraged!

James Leatzow is president of Leatzow & Associates, insurance consultants, Glen Ellyn, Ill. He will be writing regularly on insurance matters for LANDSCAPE MANAGEMENT.

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COVER STORY

A combine divides freshly cut grass plants into windrows, where they will remain for about two weeks before harvesting.

THE SEED SUPPLY

The bentgrass market is expanding faster than ever.

This year and next, the trend continues at a healthy pace.

by Jeff Sobul, assistant editor

Heavy demand for Tee-2-Green's Penncross and Pennеagle, long the dominant bentgrass varieties, has left the door open for new varieties from other companies. Though seed yields are up this year, demand is rising to outmatch supply.

Despite the development by Penn State's Joe Duich of PennLinks for Tee-2-Green last year, the company has been unable to keep up with increased demand. "We have again increased the supply of Penncross by 50 percent, but demand continues to exceed our supply," laments Bill Rose, president of Tee-2-Green.

The result: a host of new varieties have appeared in the 1980s, mostly last year and this year, with more scheduled for next year.

What's new?

From 1986 through 1988, at least six varieties have been or will be released. Joining PennLinks last year was SR 1020, from Seed Research of Oregon. Twenty thousand pounds of the variety were produced this year, to be divided among the company's 25 distributors. This will effectively keep commercial availability short. Seed Research also harvested a breeder field of another new variety, Providence (SR 1019), this year, and expects limited supplies in 1988.

Bluegrass giant Jacklin Seed Co. enters the bentgrass market this year with Putter, developed at Washington State University by Stanton Brauen.

"We have been expanding into all turfgrass markets the past several years," notes Doyle Jacklin, vice president and director of marketing. "We've been working on trying to get a bent for seven years.

"Seven years ago, we felt the demand for bents would be increasing, though not as much as it has."

International Seeds, Inc. also is producing a new variety. Called Cobra, it was developed in a cooperative effort between the company and the New Jersey Agricultural Experiment Station. Certified and formation seed is available this year for regional testing and observation. The company expects to have limited commercial quatities of seed in 1988.

But it seems that it will be at least a year or two before production of new varieties will come close to catching up with rising demand.

Sources of demand

One cause of increased demand has been the jump in golf course construction. The first choice for greens and tees for these courses has been bentgrass. Domestic use of bents also has increased greatly. "More and more courses in the Midwest and East are using bentgrass when overseeding fairways instead of the traditional bluegrass/ryegrass mix," Jacklin explains. "Golfers are demanding lower cuts on the fairways and the courses are accom-

modating them with the bentgrass."

Mike Robinson agrees.

"More courses in the South are overseeding with bentgrass in the winter and maintaining it year-round," he says.

Early indications for the fall 1987/1988 seed crop were excellent. But Mother Nature decided to flex her muscles again this year by spewing forth heavier-than-normal rains in July and into August. A heavy harvest that was expected to begin two weeks early was delayed and expectations deflated some.

"There was a potential for a bumper crop," says Tom Stanley of Turf-Seed. "Two inches of rain in mid-July with the seed in windrows probably cost us an extra five to 10 percent right there."

Bluegrass

It seemed the hardest hit would be the bluegrass crop. Heavy rains in early to middle July in eastern Washington and Northern Idaho, where Jacklin Seed produces 40 percent of the U.S. bluegrass supply, threatened the crop.

However, reports Gayle Jacklin, "estimates are way above what we expected (because of the rain). The rain did not have as big an effect as we expected." As of August 14, 90 percent of the Jacklin bluegrass crop was in the warehouse.

In general, Gayle Jacklin says, "proprietary bluegrass will be in somewhat short supply due to limited carryover and high demand for new improved bluegrass varieties."

"We don't have enough acres to produce seed to meet demand," Doyle Jacklin adds. The company plans to add bluegrass acreage across the board for 1988.

The Madras area (central Oregon east of the Cascade Mountain Range) had "its best year ever" producing bluegrass, reports Steve Tubbs of Turf Merchants. The crop of Turf Merchants' Gnome Kentucky bluegrass was excellent, but supplies are tight because demand exceeds the company's ability to increase acreage.

"Some things are short if not already gone," Tubbs explains. "If you haven't got it booked already, you're going to have trouble getting it. Basically, everything is sold. I could sell more if I had it."

For most of Turf-Seed's varieties, Stanley says, "we're going to have more seed this year than last, but because of demand there will be shortages. We've committed all of our crop to distributors already."

What is causing this high demand? "The last six years, the economy has been on a roll," Stanley notes. "The strongest indicator we have is the housing market and new starts." Increases in industrial and golf course construction also have added to the demand, both for seed and sod.

Seed remains on plants lying in windrows awaiting thrashing and transportation to cleaning facilities in Oregon.

For other bluegrass varieties, availability seems to vary from region to region, variety to variety.

The highly-rated Adelphi will be hard to come by this year. "Early visual reports seemed to indicate that what appeared to be an excellent crop, as of June, may once again have been hit by ergot disease," reports Bob Russell, president of J&L Adikes, a co-marketer of Adelphi.

Fine fescue is loaded for transport to cleaning facilities.

Northrup-King product manager Joe Churchill also reports limited supplies of Adelphi. Overall, however, Churchill is more optimistic. "After three years of bluegrass shortages, we may finally be out of the woods. Here at N-K we're cautiously optimistic. At the time of this report (mid-August), most bluegrass crops were coming in at close to normal yields."

He reports that two new N-K varieties, Aspen and Trenton, will be released this fall. "Consequently, only limited supplies of these two varieties will be available. Additional acres of both are being planted to increase supplies in the summer of 1988."

Supplies of bluegrass varieties from Lofts Seed should be adequate, agronomist Marie Pompei reports. "Princeton (104) will be offered to sod growers to use in blends," she says. "It is one of the best Kentucky bluegrasses developed in the Rutgers University program under the direction of Dr. C. Reed Funk."

Word from Larry Combs at Fine Lawn Research is that the company will have limited supplies of Chateau,

GRASS SEED AVAILABILITY CHART

Availability Key: **A**-surplus **B**-adequate **C**-limited

VARIETY	MARKETER	AVAILABILITY
Bentgrass		
Exeter colonial	Picksead West	B
Kingstown velvet	Pickseed West	C
Penncross	Northrup King	C
	Tee-2-Green	C
Penneagle	Tee-2-Green	C
Kentucky Bluegrass		
A-34 BenSun	Warren's	C
Abbey	O.M. Scott	C
Adelphi	J&L Adikes	C
	Northrup King	C
America	Pickseed West	C
Aspen	Northrup King	C
Banff	Pickseed West	B
Baron	Lofts	B
Blue Ribbon	Normarc	B
Bristol	O.M. Scott	C
Bronco	Pickseed West	C
Challenge	Turf Seed	B
Chateau	Find Lawn	C
Cheri	Jacklin	B
Classic	Peterson	B
Columbia	Turf Seed	B
Coventry	O.M. Scott	C
Dawn	Lesco	B
Destiny	Jonathan Green	C
Eclipse	Jacklin	B
	Gfld. Williamson	C
Enmundi	Seed Research	C
Fylking	Jacklin	B
Georgetown	Lofts	B
Geronimo	Jacklin	B
Glade	Jacklin	B
Gnome	Jonathan Green	B
	Turf Merchants	C
Harmony	Seed Research	A
Huntsville	Jacklin	B
Julia	Lesco	C
Liberty	Gfld. Williamson	C
Melba	Daehnfeldt	C
Merion	Jacklin	C
Merit	Full Circle	B
Midnight	Turf Seed	B
Monopoly	Peterson	B
Mystic	Lofts	B
Nassau	Jacklin/Lofts	A/B
Nugget	Jacklin	B
	Pickseed West	B
Parade	Northrup King	B
Princeton (104)	Lofts	C
Ram I	Jacklin/Lofts	B
Rugby	Northrup King	B
Touchdown	Pickseed West	B
Trampa	Daehnfeldt	C
Trenton	Northrup King	C
Trueblue	Turf Merchants	B
Victa	O.M. Scott	B
Wabash	Jacklin	B
Common Bluegrass		
Delta	Jacklin/	A
	Normarc	C
Garfield	Jacklin	B
Kenblue	Jacklin/	B
	Normarc	
Newport	Jacklin	A
Park	Jacklin	B
South Dakota	Jacklin	B
S-21	Jacklin	A
Troy	Jacklin	B
Rough Bluegrass		
Colt	Pickseed West	B
Laser	Lofts	C
Poa trivialis	Normarc	B
Sabre	International	A
Turf-Type Tall Fescue		
Adventure	Warren's	B
Apache	Turf Seed	B
Arid	Jacklin	B
Bonanza	Cenex	C
Brookston	Turf Merchants	B
Chesapeake	O.M. Scott	B
Cimarron	Lesco	B
Clemfine	Lofts	B
Finelawn I	Fine Lawn	B
Galway	Northrup King	B
Houndog	International	B
Jaguar	Gfld. Williamson	B
Jaguar II	Gfld. Williamson	C
Maverick	Pickseed West	C
Mesa	Jonathan Green	C
Monarch	Turf Seed	C
Mustang	Pickseed West	B
Olympic	Turf Seed	C
Pacer	International	B
Rebel	Lofts	B
Rebel II	Lofts	C
Richmond	Jonathan Green	B
Safe	Jacklin	B
Tempo	Normarc	B
Thoroughbred	Pickseed West	C
Titan (SR 8000)	Seed Research	B
Trailblazer	Lesco	B
Tribute	Lofts	C
Trident	Seed Research	C
Turfgem II	Turf Merchants	A
Water Saver blend	Normarc	B
Wrangler	Lesco	C
	Turf Merchants	C
Fine Fescue		
Banner	O.M. Scott	B
Logro	Jacklin	B
Chewings Fescue		
Agram	Pickseed West	C
Enjoy	Internationl	C
Estacada	Turf Merchants	C
Jamestown	Lofts	B
Puma	Daehnfeldt	B
Shadow	Turf Seed	B
Victory	Pickseed West	B

Continued on page 24

just released to the market this year. Kent Wiley, president of Pickseed West, notes that his company's yields were down slightly because of the rain. Even so, bluegrass "should be in better supply than last year," he says.

Lesco director of research and development Art Wick expects bluegrass yields to be below normal as well, though exact figures were still unavailable at presstime.

Common bluegrasses from Jacklin will be in either adequate or near-surplus supplies. Rough bluegrasses will also be in good supply, except for Laser, a new variety from Lofts.

The fescues

Wick says that the latest trend in turf-type tall fescues (and all perennials, for that matter) is the dwarf or semi-dwarf cultivar.

"The dwarf is going to push tall fescue use further north," he says. "They'll provide for the transition zone and points north the density and color homeowners demand."

In additon, he says, "on dormant warm-season grasses, the dwarf is advantageous because it provides a more consistent playing surface because of growth rates."

Dave Nelson of the Oregon fine and

Tom Stanley says Turf Seed has committed all its crop to distributors already.

Lofts agronomist Marie Pompei says increased acreage can't keep up with rising demand.

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GRASS SEED AVAILABILITY CHART

Availability Key: **A**-surplus **B**-adequate **C**-limited

VARIETY	MARKETER	AVAILABILITY	VARIETY	MARKETER	AVAILABILITY
Creeping Red Fescue					
Dawson	Northrup King	B	Ruby	Northrup King	B
Ensylva	International	B	Shademaster	Lesco	C
Flyer	Turf Seed	C	Virtus	Tur Merchants	B
Fortress	Turf Seed	B			
Hard Fescue					
Attilla	Turf Merchants	A	Spartan	Pickseed West	B
Aurora	Turf Seed	C	SR 3000	Seed Research	B
Reliant	Lofts	B	Tournament	Pickseed West	C
Sara	Normarc	C	Waldina	Turf Seed	C
Scaldis	Northrup King	B			
Sheep Fescue					
Azay	Pickseed West	C	Bighorn	Turf Seed	C
Perennial Ryegrass					
Allaire	Jonathan Green	B	Manhattan II	Turf Seed	B
	Turf Merchants	A	NK200	Northrup King	B
All*Star	Adikes/Jacklin	B	Nova (SR 4031)	Seed Research	C
Aquarius	Turf Merchants	C	Omega II	Gfld. Williamson	B
Barry	Turf Merchants	A		Turf Seed	B
Birdie II	Turf Seed	B	Ovation	O.M. Scott	B
Blazer	Pickseed West	C	Palmer	Lofts	B
Caravelle	O.M. Scott	B	Patriot	Turf Merchants	B
Citation II	Turf Seed	B	Pennfine	Turf Merchants	C
Commander	Lesco	B		Northrup King	C
Cowboy	Lofts	B	Polly hybrid	Daehnfeldt	A
Dasher	Pickseed West	C	Prelude	Lofts	B
Dasher II	Pickseed West	C	Premier	Normarc	B
Delray	Northrup King	B	Regal	International	B
Derby	International	B	Regency	Lesco	B
Diplomat	Lofts	C	Repell	Lofts	B
Fiesta	Pickseed West	B	Rodeo	Turf Merchants	A
Fiesta II	Pickseed West	B	Sherwood	Jonathan Green	C
Gator	International	B	SR 4000	Seed Research	B
Goalie	Northrup King	B	SR 4100	Seed Research	B
Jazz	Pickseed West	B	Tara	Hubbard Seed	C
Lindsay	International	C	Vintage-2/DF	Lesco	B
Loretta	O.M. Scott	B	Yorktown II	Lofts	B
Manhattan	Normarc	B			
Manhattan II	Turf Merchants	A			
Intermediate Ryegrass					
Agree	Lofts	C	3CN	Lesco	B
Annual Ryegrass					
Dalita hybrid	Daehnfeldt	A	Wilo tetraploid	Daehnfeldt	A
Tetragold	Normarc	B			
Winter Overseeding Blends/Mixtures					
CBS II (perennial ryegrass)	Turf Seed	B	Ph.D.	International	B
Champion (perennial ryegrass)	Seed Research	C	Proform	Gfld. Williamson	B
Dixie Green	International	B	Showboat	International	B
Double Eagle	Lesco	B	Signature Classic	Pickseed West	B
Double Eagle +Sabre	Lesco	B	Transtar	Lesco	B
Eagle	Lesco	B	Triathelawn	Turf Seed (tall fescue blend)	B
Eagle 3	Gfld. Williamson	B	Triple Play	Fine Lawn (perennial ryegrass)	B
Futura Plus	Pickseed West	B	Vintage Plus	Lesco	B
Futura 2000	Pickseed West	B	V.I.P. (rye blend)	Turf Merchants	B
Marvelgreen	Lofts	B	Winter Turf Blends: I, III, V, VII, VIII	O.M. Scott	B
Medalist series	Northrup King	B	Blend: IX		C
Par	Lesco	B			
Wildflower Mixes					
18 varieties	Lesco	B	Regional mixes	Daehnfeldt	A/B
Pinto	Jacklin/Lofts	B			
Other					
Four Star Sod Blend	Jacklin	C	Survivor Tall Fescue Mix	Seed Research	B
Fults saltgrass	Northrup King	B	Trophy Tall Fescue Mix	Seed Research	B
Patch Work (for bare spots)	Normarc	B	Various Mixtures	Northrup King	B
Reubens	Jacklin	B			
Streaker Redtop	Jacklin	B			

SEED REPORT *from page 22*

tall fescue commissions also sees benefit in the dwarfs. "The second generation, finer-leaved dwarfs could be competing with bluegrass or ryegrass soon. They may very well be competitive in the future because they have good disease resistance, are attractive, deep-rooted and lower maintenance that blue and rye. Dwarf varieties are appearing in greater quantity this year," he says.

Lesco introduced Trailblazer dwarf turf-type tall fescue last year, and Wick expects adequate supplies for this year, though he notes fescue crops will be slightly low due to the weather. Turf-Seed will introduce Monarch this year; Turf Merchants has Wrangler; and Mesa is a new variety from Northrup-King.

In general, the rest of the tall fescues are coming in a bit below normal,

continued on page 28

Pickseed West research director Jerry Pepin reports good quantities of Fiesta II perennial ryegrass.

Pickseed West president Kent Wiley saw rains delay harvesting and lower yields for all varieties.

Bill Meyer has high hopes for Turf Seed's Monarch semi-dwarf turf-type tall fescue.

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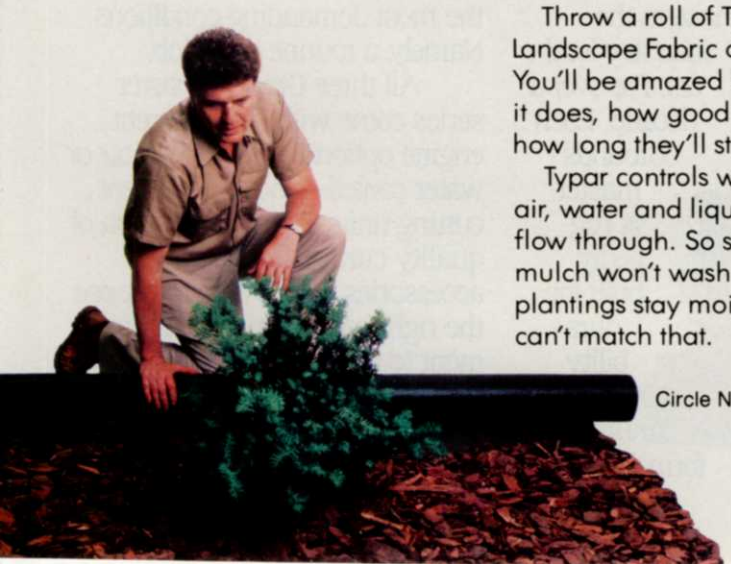

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Jacklin's warehouse was stocked in June, but not with its own proprietaries. They were sold out. This year's crop faces the same fate.

SEED REPORT *from page 24*

though better than last year. Again, the weather conditions in Oregon's Willamette Valley, the mecca of U.S. fescue and rye seed production, kept this crop from reaching full potential.

Much of the average crop of tall fescues was harvested before the heavy rains, Nelson says.

Most varieties of turf-type tall fescues are in adequate supply.

"Rebel II and Tribute are new varieties, so production has to catch up," Pompei says. (Tribute was named in honor of the late Peter S. Loft.)

Mustang tall fescue will be in good supply, but Pickseed West's other tall fescues, Maverick and Thoroughbred, will be limited.

On the whole, supplies of other fescue species should be adequate. "Fine fescue crops are average as well this year," Nelson reports. Low moisture in the spring had some affect on the crop.

New entries into the market this year include Flyer creeping red fescue from Turf-Seed. International Seed will introduce Longfellow chewings fescue for 1988.

Ryegrass

The ryegrass crop also felt the effects of the Valley's weather this year. "Yields are down some because of warm weather in May and June," explains Bill Meyer—10 percent or more.

Ideally, the spring months are supposed to be the wet ones, with a dry July and August for the harvest. "It just went the opposite this year," notes Wiley. 'We expect to fulfill all our orders this year, but the total supply won't be sufficient to cover the demand."

Pickseed research director Jerry Pepin reports that 500,000 pounds of Fiesta II, a new variety, will be available this year.

International's Harry Stalford expects things to be tight for another two years before acreage catches up and demand slows down. "We don't want to overproduce, though."

Lesco's yields are down slightly as well. "It's not a surplus crop so prices will remain strong," notes Wick. (Was that a collective groan from the readers?)

Lesco's Art Wick sees dwarf tall fescue as the next trend in turfgrass production.

Stanley agrees. "It seems the last few years we haven't had an average year," he says. Consequently, prices will stay the same. (At least they aren't rising.)

Pompei of Lofts also reports adequate supplies, though "Diplomat is being phased out of seed production."

"Excellent" crops of SR4000 and 4100 are reported by Mike Robinson at Seed Research. "The bad news is we're pretty well sold out.

"The whole Valley could be off some," he says. "From what I could see we weren't hurt too badly."

Part of the strain on ryegrass supplies is a demand increase caused by the federal Conservation Reserve Program (CRP). Under the program, farmers are paid not to grow food crop. Rather, they are asked to grow grass for 10 years.

The popularity of the program in the Midwest has added to the demand for common grass varieties and fescue, a popular forage grass for many years.

The program has siphoned off much tall fescue because seed growers realize a greater profit from selling to the government rather than regular seed consumers. With tall fescue supplies limited, the burden has fallen on the ryegrasses to make up for the deficiency, the reason for the heightened popularity of ryes in recent years.

A final note...

Supplies are short and prices are high; bad for buyers, good for growers and marketers. As a result, as if it hasn't been stated enough yet, call now for orders or it probably will be too late. Sounds a lot like last year. The good news is that an end is in sight to rising prices and low supplies, hopefully by the end of the decade. That is, of course, if Mother Nature cooperates.

LM

Stan Brauen, Wash. St. Univ., says Jacklin's Putter bent compares favorably with Penncross.

Doyle Jacklin, Jacklin Seed, has been looking into proprietary bentgrasses for seven years.

Harry Stalford, International Seed, notes wide yield variation from field to field of the same variety.

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U(versa)TILITY VEHICLES

Less known in public circles than its glamorous cousin the golf car, utility vehicles perform a myriad of tasks in industries ranging from golf to garbage.

by Jeff Sobul, assistant editor

During a recent National Football League exhibition game, a player incurred a severe dinger to the head. It was enough of a blow to keep anyone from getting him off the field upright. So on to the field to retrieve the injured man cruised an odd-looking three-wheel vehicle with a flat bed—a utility vehicle.

Drive past any construction site and you notice that these vehicles are performing any number of tasks. In fact, these things are just about everywhere. And with less than 20 companies producing them, the opportunity to enter the market exists.

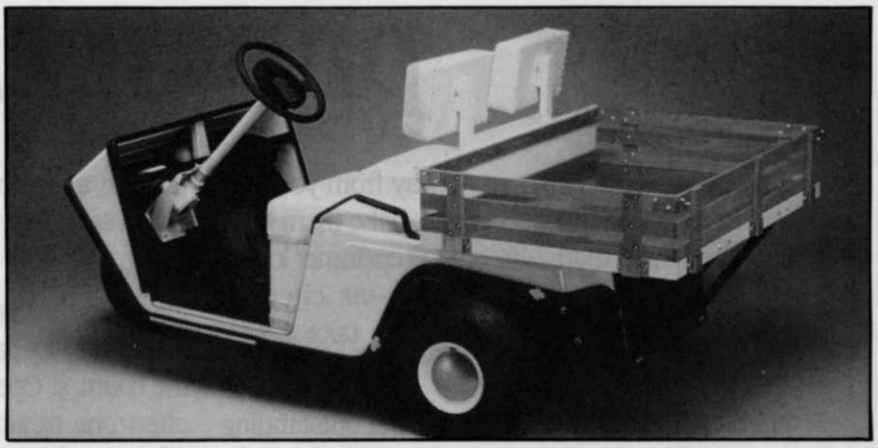
Ronald Skenes, E-Z-Go Division of Textron, believes the utility vehicle (U.V.) market is growth-oriented. "As long as golf course construction continues, that will be one area where there will be new growth," he notes.

E-Z-Go has only been in the utility vehicle market for a few years, originally starting as a golf car manufacturer. The company has essentially created two lines for its utility vehicles, a heavier industrial and a lighter turf vehicle line.

John Deere & Co. recognized the opportunity presented by the market, entering it in January with the AMT-600, "a whole new concept in off-road vehicles," according to Deere's Bob Tracinski.

The AMT-600 is the first utility vehicle to drive on a five-wheel chassis, which Tracinski says adds stability.

continued on page 36



Melex Cargo Carrier

UTILITY VEHICLE SPECS
Page 34

Club Car Carryall II

Cushman Eagle

Daihatsu Hijet

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The HR-15 also features a 20-gallon fuel tank, enough for a full day of mowing. And the rugged 78-hp Perkins diesel and radiator are mounted up front, out of the way of clippings and debris, for clean, cool operation.

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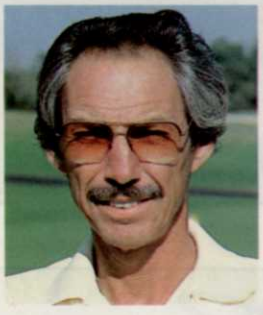
UTILITY VEHICLE GUIDE

MANUFACTURER	MODEL	ENGINE	PAYLOAD	ADDITIONAL INFORMATION
CHI Industries P.O. Box 1148 Benton Harbor, MI 49022-1148	Haul Master HX-4660	16 hp 4-cycle	500 lbs	2 seats 4-wheel
	Haul Master HH-1216	16 hp 4-cycle	500 lbs.	2 seats 3-wheel
Club Car Inc. P.O. Box 4658 Augusta, GA 30907-3000	Carryall I (gas)	8.5 hp 4-cycle	250 lbs	2 seats 4-wheel
	Carryall I (electric)	2 hp	250 lbs.	2 seats 4-wheel
	Carryall II	8.5 hp 4-cycle	500 lbs.	2 seats 4-wheel
Columbia ParCar One Golf Car Rd. Deerfield, WI 53531	Utilitruck (gas)	2-cycle	800 lbs.	2 seats 4-wheel
	Utilitruck (electric)	electric	500 lbs.	2 seats 4-wheel
	Runabout (gas)	2-cycle	750 lbs.	2/4 seats 4-wheel
	Runabout (electric)	electric	500 lbs.	2/4 seats 4-wheel
Cushman Turf Care Div. of OMC Lincoln P.O. Box 82409 Lincoln, NE 68501	Eagle 550	8.5 hp 4-cycle 12.5 hp (optional)	800 lbs.	Polyurethane body
	Eagle 550,551, 552 553, 554, 555	8.5 hp 4-cycle 12 hp air-cooled electric	800 lbs.	Metal frame
	Turf-Truckster 530, 532	22 hp 4-cycle	1500 lbs.	530: 3-wheel 532: 4-wheel
	Runabout	22 hp 4-cycle	1500 lbs.	3-wheel
Daihatsu America, Inc. 4422 Corporate Center Los Angeles, CA	Hijet	4-cycle 3-cylinder	1500 lbs.	6 body types
John Deere & Co. John Deere Rd. Moline, IL 61265	ATM 600 (gas)	8.5 hp	600 lbs.	5-wheel configuration
E-Z-Go. Div. of Textron P.O. Box 388 Augusta, GA 30913-2699	XT-300 (electric)	6.5 hp	1,000 lbs. (includes operator & passenger)	—
	GTX 300 (gas)	8 hp	1,000 lbs.	2 seats
	XT-500 (electric)	6.5 hp	1,000 lbs.	Bed size: 44″×28″×8″
	GXT 800 (gas)	8 hp	1,000 lbs.	6 attachments
	GXT 1500 (gas)	18 hp	1,500 lbs.	Bed size: 52″×54″×12″
Hahn Agri-Turf Turf Products Division 1625 N. Garvin St. Evansville, IN 47711-4596	Multi-Pro 44	16 hp Kohler	1,500 lbs.	Converts to bed, spreader, sprayer
Melex USA Ltd. 1200 Front St. Suite 101 Raleigh, NC 27609	Cargo Carrier (electric)	21.1 hp	330 lbs.	2 seats 3-wheel wood or steel side
	4-Passenger (electric)	21.1 hp	—	4 seats 4-wheel
Toro Commercial Products 8111 Lyndale Ave. So. Minneapolis, MN 55420	Workmaster	14 hp Kohler	1,000 lbs.	3-wheel
Turf Vac 15701 Graham St. Huntington Beach, CA 92649	Sundancer Model 1	11 hp Briggs & Stratten	1,100 lbs.	3-wheel
	Sundancer Model 4 & 8	18 hp Briggs & Stratten	1,500 lbs.	3-wheel



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Bloomingdale Country Club
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He sees stability, and general safety, to be one of the needs manufacturers must address in off-road vehicles.

Other improvements

Another need facing utility vehicles seems to be lowering maintenance cost and boosting efficiency. "They need longer life, more efficient air-cooled engines with more sophisticated engines," say Ron Kimball and Walt Olmstead of C.H.I. Industries, Benton Harbor, Mich., makers of the Haul Master. They also see a need for larger alternators, better fuel, air and lubrication systems.

According to Kent Hahn, general sales manager for Hahn Agri/Turf products, U.S. manufacturers were awakened to cost-effectiveness problems a few years ago when Japanese companies such as Daihatsu America introduced more economical machines.

He feels that U.S. companies have been taking strides to correct the problem. He notes that Hahn recently switched to the new Kohler Magnum computerized engine.

The future

The trend in the past and present for utility vehicle manufacturers has been to build a vehicle that can do a multitude of tasks. However, Hahn sees manufacturers going to more specialized vehicles. His company's Mutli-Pro 44 is designed to perform only chemical and fertilizer applications.

On the flip side, Daihatsu America's Hijet is one of the more versatile vehicles, adding to a basic chassis any number of options designed to expand the vehicles performance. The Hijet has been available in the U.S. for only eight years. The company is in the process of setting up a new distributer network, with about 45 appointed as of mid-August, the goal being between 100 and 150 by the end of the year. **LM**

John Deere AMT-600

E-Z-GO GXT-800

Toro Workmaster

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BLUE-GREEN ALGAE AND BLACK LAYER

Continuing research at Iowa State University suggests the causes of black layer on golf greens. Only when the causes are determined can appropriate remedies be determined.

by Clinton F. Hodges, Ph.D., Iowa State University

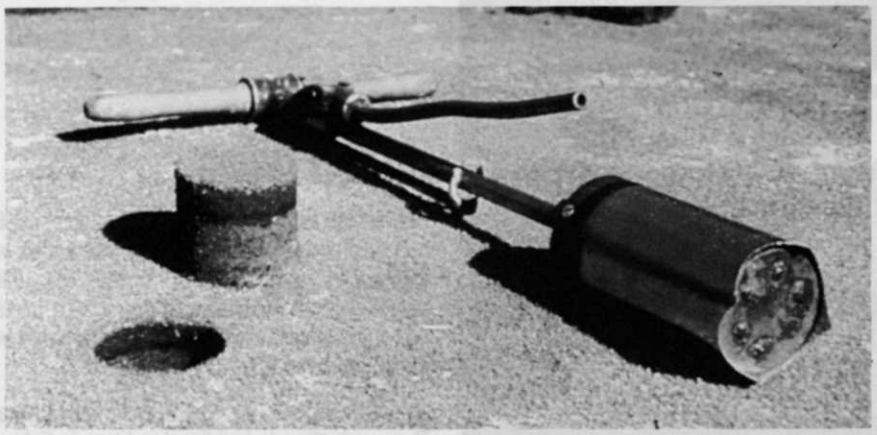

Photo 1: Black layer usually occurs about one-half to three inches below the green's surface.

A gradual increase in the construction and use of high-sand content golf greens in the last 20 years has brought into focus the need for research on microbiological ecosystems that develop in these greens.

Many high-sand content greens develop problems shortly after new construction or renovation of greens. Problems range from increased activity of non-pathogenic micro-organisms and soil-borne pathogens, unpleasant odors, and impaired drainage. Many of these problems, or combinations, result in poor growth or loss of turf.

One problem that is of special interest to golf course superintendents in the U.S., Canada and Australia is a condition called "black layer." Although the expression adequately describes the condition's appearance, it provides little insight into its causes.

Researchers and superintendents have proposed many theories on black layer's causes. Theories range from types of chemicals applied to greens, to nutritional and/or chemical imbalances in the sand greens, to biotic factors such as algae and bacteria. The ideas differ, but most seem to agree that the disorder is related to water problems and to anaerobic conditions.

In this respect, black layer might better be described as anaerobic decline of creeping bentgrass, as has been suggested by Houston Couch, Ph.D.

There seem to be two primary types of black layer development, surface and subsurface layering. Surface black layering develops at the surface of the green and extends downward, forming a layer one to three inches thick. Subsurface black layering generally occurs about one-half to three inches below the green's surface. The layer may range from one-quarter inch to more than one-inch thick (Photo 1).

The mix between the surface of the green and the top of the subsurface layer may appear normal in color, or may show a slight darkening.

Subsurface black layering may be more complex on old soil-type greens where sand top dressing has been initiated. In most instances where black layer occurs under these conditions, the layer is where sand and soil meet. If alternating applications of sand and other top dressing mixes have been applied to the green, the black layers may occur as a series of thin bands (one-quarter inch thick or thinner). Although black layer develops most aggressively in high-sand content greens, it can occur in greens with a relatively high soil content. The black layer in high-soil content greens is generally thin and at the surface, often directly under a thin thatch layer.

Black layer shows a number of variations on high-sand content greens. The layer may involve an entire green, but more often it develops in portions of the green. Low areas of a green, or shaded areas with poor air movement, may show the most successful development and the more severe damage. But the disorder is by no means restricted to such areas. The layer itself (especially subsurface) may be discontinuous, or be composed of unconnected circular-to-oblong globules of black layer material.

The cause-and-effect relationship between black layer and dead turf seems to be very complex. Perhaps one of the least-noted facts about black layer is that not all black-layered greens result in dead turf. It is not uncommon to find healthy turf on high-sand content greens with a distinct subsurface layer. Such greens may not have optimum infiltration or drainage, but the turf can be maintained.

When turf is lost in association with black layer, it dies in a relatively nondescript pattern. The grass can die rapidly by turning a straw to reddish-straw color; or occasionally, the afflicted areas may become chlorotic prior to dying and becoming straw-colored.

A variety of odors is emitted from black-layered greens with dying turf. The odors are not associated with healthy turf on greens with or without black layering. They have been de-

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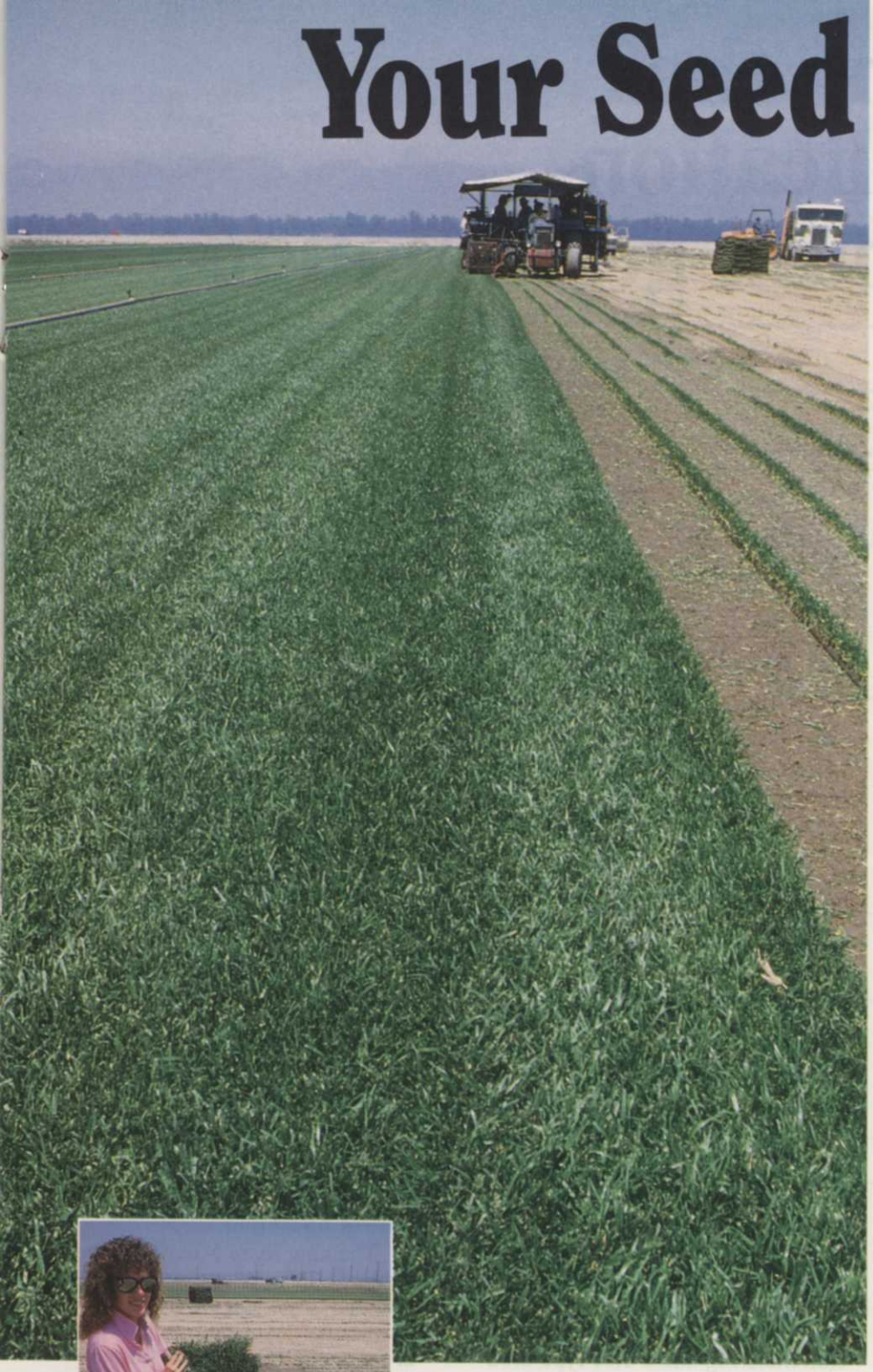

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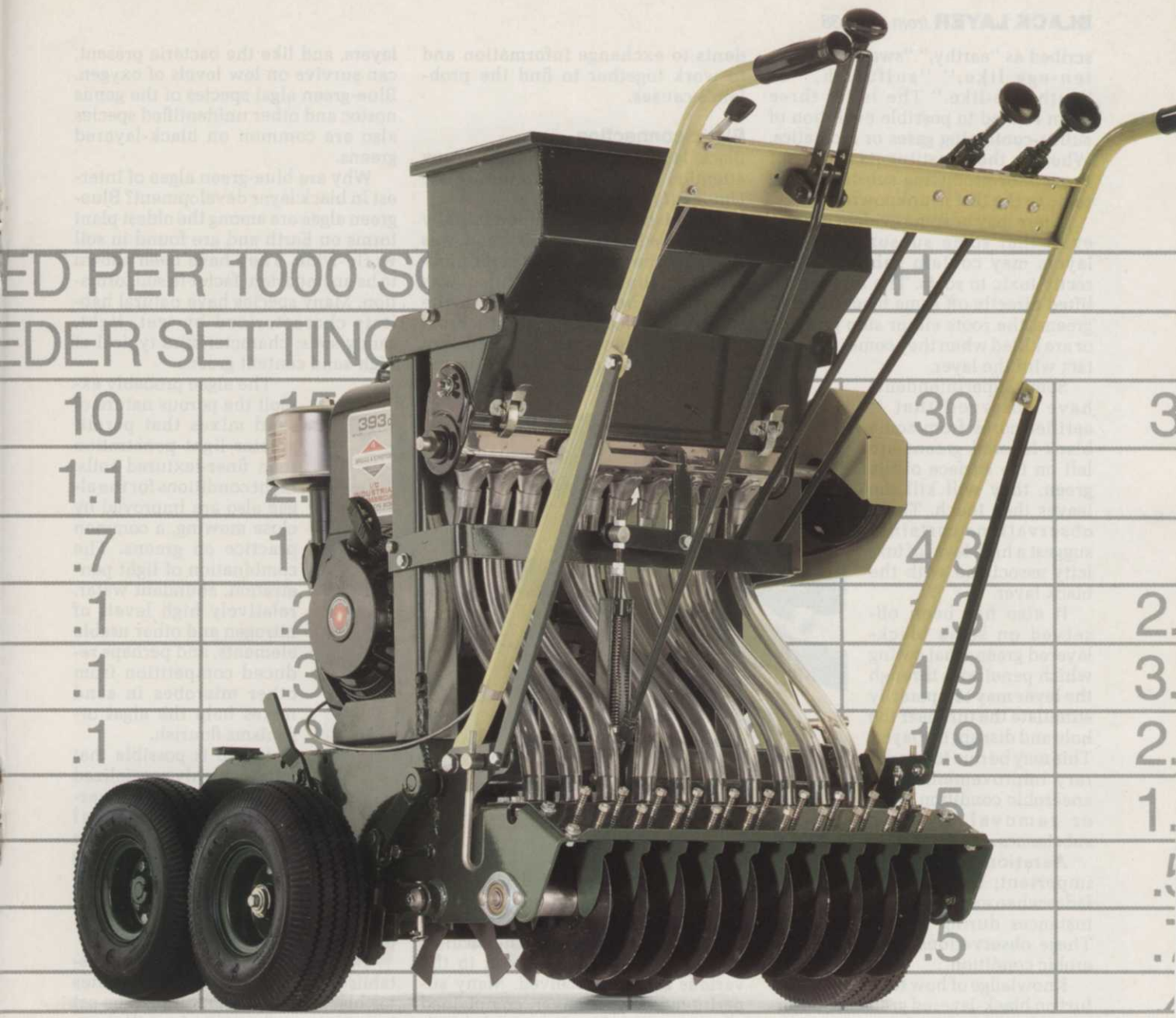

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scribed as "earthy," "swampy," "rotten-egg like," "sulfurish," or "outhouse-like." The latter three seem related to possible evolution of sulfur-containing gases or aromatics. Whether the constituents of any of these odor-producing substances are toxic to the turf is unknown.

There may be some evidence, however, that some subsurface black layers may contain substances directly toxic to roots. The turf can be lifted directly off some black-layered greens; the roots either stop growing or are killed when they come into contact with the layer.

Some superintendents have observed that if aerifier cores from some black-layered greens are left on tbe surface of the green, they will kill the leaves they touch. These observations certainly suggest a high level of toxicity associated with the black layer.

It also has been observed on some black-layered greens that coring which penetrates through the layer may temporarily stimulate the turf near the hole and disrupt the layer. This may be due to temporary improvement of an anaerobic condition and/or removal of toxic substances.

Aeration seems very important; the layer's color often fades when exposed to air and in some instances during winter dormancy. These observations suggest an anaerobic condition.

Knowledge of how to control loss of turf on black-layered greens is, unfortunately, scarce. Reducing irrigation to a minimum and increasing aerification seems to have the greatest effect on slowing black-layer development, but these operations are unlikely to end the problem. Using wetting agents and fungicides with algicidal properties also may help. To date, however, I have not seen black layer eliminated by any chemical or cultural means; but many creative superintendents have learned to manage the problem somewhat.

It also seems that the problem may decrease in severity with time, irrespective of cultural and chemical practices. Once established, however, it seems to always be active at some level.

Our prospects for effective control of this problem seem to rest squarely on the ability of the research community and superintendents to exchange information and to work together to find the problem's causes.

Biotic connection

Black layer was first brought to my attention in 1978, on the Iowa State University golf course.

The black-layer condition initially was viewed as a curiosity and was thought to be peculiar to specific problems on that course. It also was thought to be associated with the green's physical components. From 1978 to 1984, however, the number of black layer samples received in my laboratory increased dramatically, and were being received from midwestern, eastern and south central states, and Canada. It soon became apparent that no physical, chemical or cultural factor was common to the various samples received. Many superintendents, however, complained of poor water infiltration and/or drainage of greens.

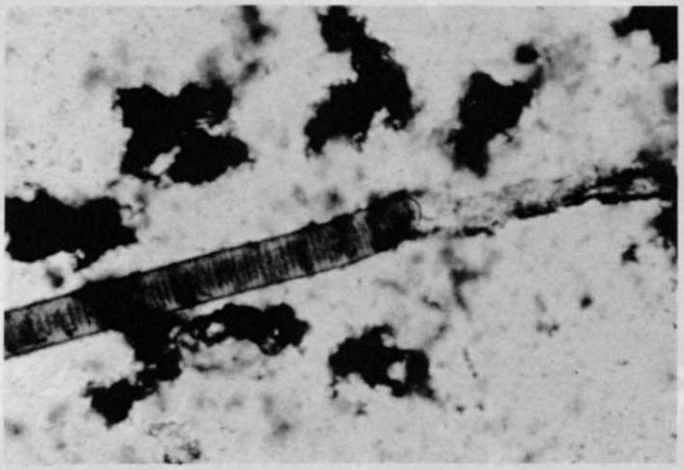

Photo 2: Species of blue-green algae in the genus *oscillatoria* glide on extracellular mucilage produced by the algal organism.

During 1985's growing season, all black layer samples were carefully examined for the types and prevalence of microorganisms associated with the disorder. This involved isolation of organisms in leaf and root tissues, in the top one-eighth inch of the sand mix, in the subsurface sand not involved in the black layer, and in the black layer. Some common denominators evolved from these efforts.

Perhaps of greatest interest is that the black layer is essentially devoid of aerobic microbes. However, mixed cultures of anaerobic bacteria (bacteria that can survive on extremely low levels of oxygen) have been isolated regularly from black layers. Species of pythium and another unidentified fungus also are found in some black layers, and like the bacteria present, can survive on low levels of oxygen. Blue-green algal species of the genus nostoc and other unidentified species also are common on black-layered greens.

Why are blue-green algae of interest in black layer development? Blue-green algae are among the oldest plant forms on Earth and are found in soil world-wide. They have been shown to be an important factor in soil formation. Many species have natural habitats characterized by wet, light, sandy soils; characteristics typical of high-sand content greens.

The algae probably exploit the porous nature of sand mixes that permit greater light penetration than finer-textured soils. Light conditions for the algae also are improved by close mowing, a common practice on greens. The combination of light penetration, abundant water, relatively high levels of nitrogen and other usable elements, and perhaps reduced competition from other microbes in sand mixes help the algal organisms flourish.

It also is possible that today's highly specialized pesticides may inadvertently promote algal growth. General biocides (mercury and arsenic) once commonly used may have contained algal growth more than many of the less toxic and more biodegradeable compounds of today.

Once the blue-green algae are established on a green, the prerequisites for black-layer formation may be set into motion. Species of oscillatoria and nostoc are filamentous blue-green algae; that is, they are worm-like filaments and are mobile. Their movement is facilitated, in part, by producing an extracellular mucilage upon which they glide over the surface of the sand (Photo 2).

Mucilage probably protects the algae from desiccation and also functions as an adhesive, holding the algae to sand particles and binding particles together. These materials are hydrophilic, quite stable, and adhere strongly to the sand particles.

It is believed that the extracellular mucilage, in combination with organic matter produced by the death of algal organisms, gradually fills and plugs the pores between sand particles at the green's surface. The initial effect of this process, prior to any black-layer formation, may be a slow

continued on page 44

the CLEAN-UP MACHINE

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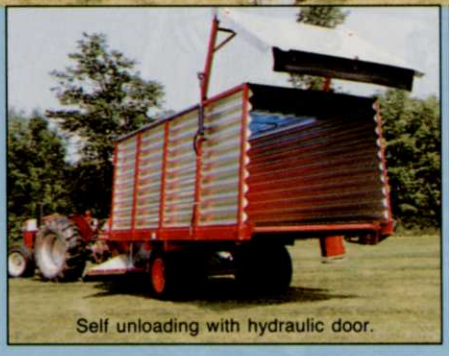
Picking up debris in Culvert.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86-58

Circle No. 106 on Reader Inquiry Card

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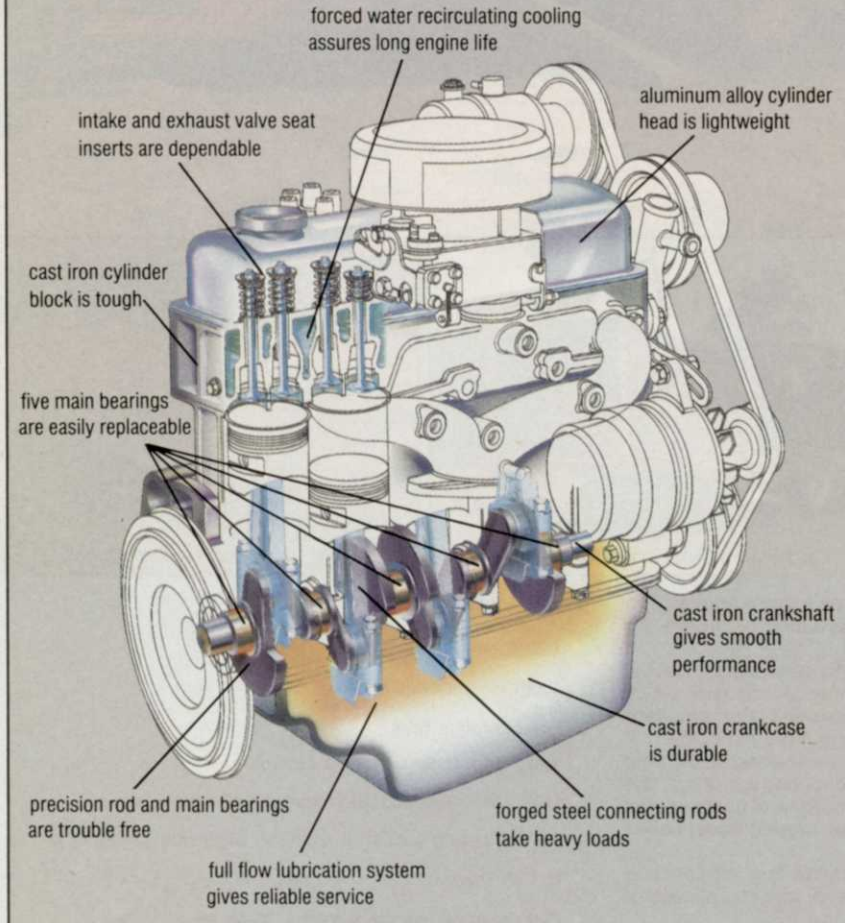
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R-11/14

Circle No. 143 on Reader Inquiry Card

BLACK LAYER *from page 42*

ing of water infiltration and drainage due to a biologically induced perched water table at the green's surface.

Surface or subsurface black layer formation may be started at this point.

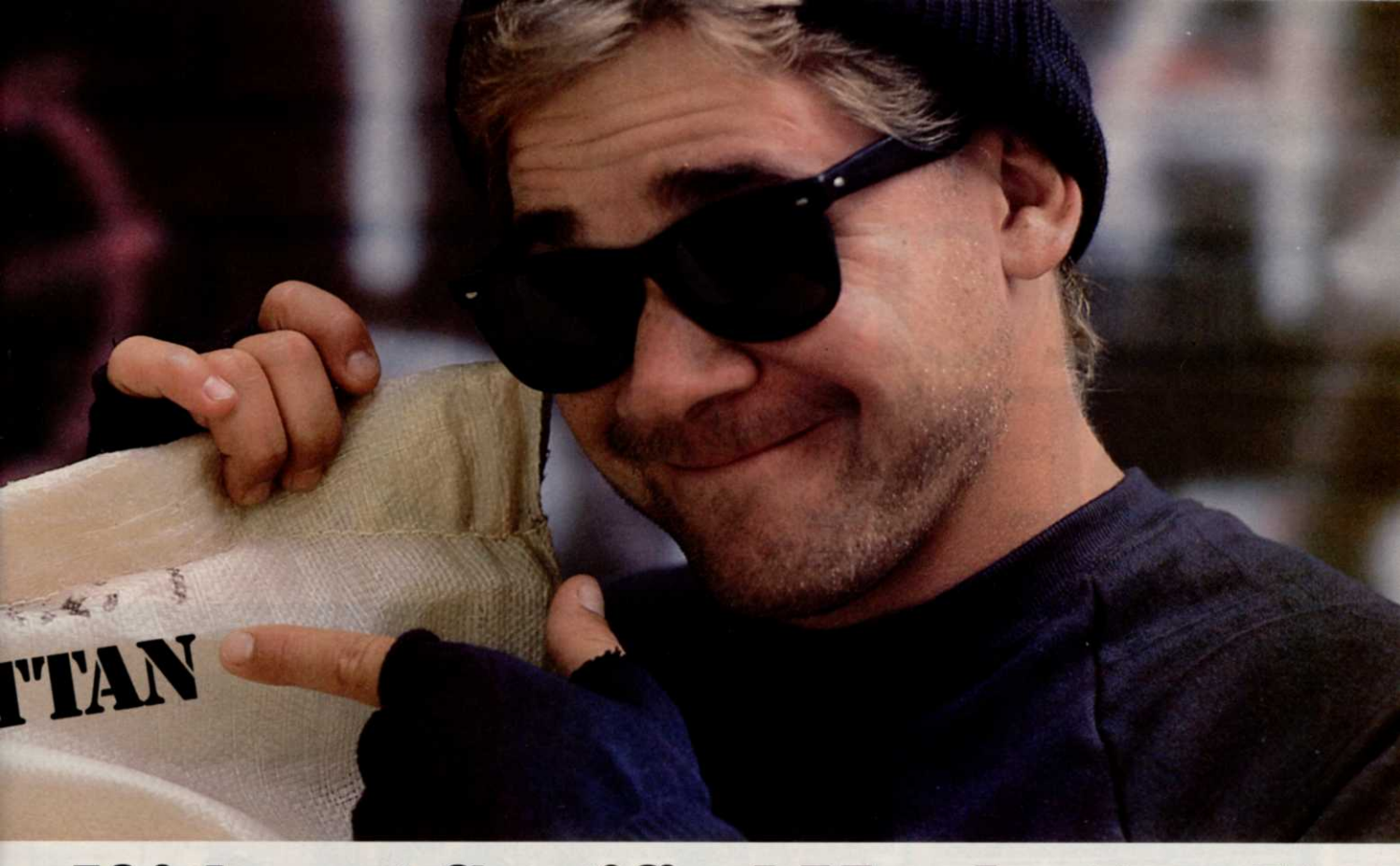
If growth of the blue-green algae is excessive, the green's surface may be tightly sealed and accumulation of mucilage, dead algae, and infestation of these products by other microbes (bacteria and fungi) may result in surface black layering. If the algae proliferation is slower, the mucilage and other organic products of dead algae may move more slowly into the sand mix's profile and eventually form a barrier below the surface. This barrier of mucilage and other organic substances from the algae may then serve as substrate for anaerobic bacteria and some fungal species.

It is not entirely clear what contributes to the black layer's color, but some of the color is probably due to deteriorating organic matter (perhaps algae and organic substances, and tissues from grass roots). Also, the mucilage supports bacterial and fungal growth and probably promotes mineralization of the organic matter in the layer. This activity would further contribute to the layer's color and may be further influenced by fertilizers and iron and sulfur amendments. Iron and sulfur can be metabolized by algae and bacteria, often in different ways, depending on the presence or absence of oxygen.

Black layer might be described as anaerobic decline of creeping bentgrass.

The black layer problem seems to be the result of an abnormal opportunistic microbiological ecosystem. The system's components (blue-green algae, bacteria, and perhaps some fungi) are set into motion by the physical characteristics of high-sand content greens and the cultural regimes required to maintain them.

The superintendent may have little control over the development of black layer. He is often locked into the requirements of the sand green cultural regime and can make only minor changes in his operation. If enough components of the ecosystem emerge on the green, black layer will form. The concept of an abnormal microbiological ecosystem forms the basis for research being conducted at Iowa State University on the black layer problem. **LM**



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Circle No. 147 on Reader Inquiry Card

THE RECREATION SENSATION

by Heide Aungst, managing editor

Those wanting to escape the congestion of San Diego can head to the peaceful oasis of Lake Poway, just 20 miles from the city. The park offers visitors 34 acres of lakes and recreation areas. But the favorite spot among children is the playground. Park director Lee Lewis chose BigToys wooden play structures to establish a rural theme which carries through the landscape. "We originally planned a high sierra theme, but converted over to a more applicable theme with woods. We got rid of synthetic equipment," Lewis says.

The various types of play equipment allows Lewis to segregate the 1/4-acre play area by age group. He has placed the equipment in designs which avoid collisions between children. Lewis' crew inspects the equipment regularly to minimize risk and maintenance costs. Lake Poway has not had any law suits since the installation of the equipment 10 years ago.

To keep the sanded play area weed-free, Lewis sprays it annually with Roundup. Children rarely track sand onto the turf because landscape timbers, provided by the California Conservation Corp., separate the sand from the turf. The turf surrounding the play area is Northrup King's Medalist blend of fescue and bluegrass. All turf areas are irrigated. The crew mows once a week at 2 1/2 inches. Lantana (left) grows as a ground cover around the area. Sycamores provide shade for tuckered-out youngsters.

BigToys: Circle No. 190 on Reader Inquiry Card.

It took an act of Congress, but visitors to our capital city can enjoy a work out in front of the capitol on the Parcourse Fitness Cluster. Congress approved the measure to put the center on the mall, and it opened for public use in April 1986.The redwood and stainless steel equipment conforms to the natural landscape of the historic area. "The mall is a very active place. At lunch there's hundreds of joggers. They can run right from work," says Ken Williams, the landscape contractor who installed the system. Williams arranged the equipment in four clusters covering an all-weather asphalt area 16 X 64 feet. The National Park Service maintains the area by sweeping the asphalt at least once a week and checking for damage to the equipment.The arrangement of the equipment lets the park service easily mow the surrounding turf which consists of K-31 fescue, Palmer and Citation ryegrass and Merit bluegrass.

Joseph Kanter, chairman of the First National Bank of Florida, donated the equipment. An avid jogger for 40 years, Kanter has reportedly run the equivalent of the earth's circumference. He chose the Parcourse equipment because it fits the needs of all ages and levels of fitness, including the disabled.

The amount of the donation is private, but Williams says such an installation would run about $4,500, with the equipment valued at $13,000.

Parcourse: Circle No. 191 on Reader Inquiry Card.
Williams Landscaping: Circle No. 192 on Reader Inquiry Card.

Kids have always had fun down on the farm. That tradition continues, with a more modern twist, at the Juilfs Park playground in Cincinnati, Ohio. The land used for the park began as the Juilfs family farm. The park designers, Jennings of Ohio, reconstructed the old farm silo into an observation tower. The play area, constructed in 1986, uses wooden equipment from Quality Industries to maintain the family-farm flavor.

The 150 ft. X 130 ft. sanded playground took six months to grade and construct. The sand depth is 15 to 18 feet and has not needed to be treated for weeds. Eight different slides, including a zoom slide (above left) and underground slide, make the playground an adventure for kids of all ages. The bench swing (above right) gives adults a break while kids play on the equipment. Trees provide shade and an aesthetically pleasing perimeter to the play area. The staff planted three 25-foot sycamores. Other trees planted include six red maples, six October glory maples and one pin oak. Already in the area was a swamp willow, four scotch pines and one white pine.

The park management crew originally sodded the turf area with bluegrass, but overseeds because of wear from heavy traffic with 80 percent K-31 tall fescue and 20 percent Regal ryegrass. The crew mows the non-irrigated area twice a week.

The entire play area cost about $43,225. The project won the 1986 Ohio Parks and Recreation Association's "Outstanding Award" for recreation facilities costing less than $75,000.

Quality Industries: Circle No. 193 on Reader Inquiry Card.
Jennings of Ohio: Circle No. 194 on Reader Inquiry Card.

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Circle No. 138 on Reader Inquiry Card

PART I OF II

COMPUTERS IN THE GREEN INDUSTRY

Green industry companies are turning to computers to help manage their businesses. But before you invest, ask yourself these questions.

by Rudd McGary and Ed Wandtke

All businesses run on information. The ability of a company to control and use information will generally make the difference between a highly successful company and one that either "just makes it," or "goes under." The green industry is no exception.

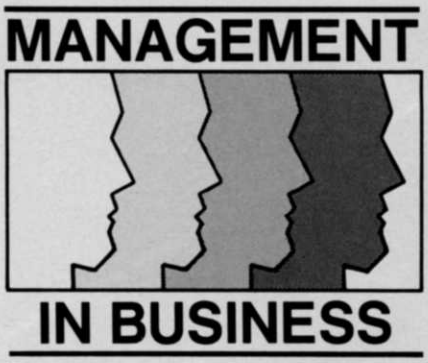
As parts of the green industry grow and mature, owner/operators must have easy access to information in forms that will help them manage their companies better. In addition, billing and accounting generally used by the green industries need to be monitored so that cash flow is controlled internally.

Enter: the computer.

More green industry firms recognize the need for a device that will help process data in their day-to-day operations. One answer is to handle the various jobs manually by increasing staff. Another is to explore the benefits of working with computers, which are many. But many questions need to be asked before deciding on the type of computer to buy.

Let's get rid of some of the myths that surround computers, both large and small.

Wandtke and McGary are senior consultants with All-Green Management Associates in Columbus, Ohio. Dr. McGary focuses on marketing and management issues. Wandtke focuses on operations and financial questions.



First, the function of the computer, in most cases, is to organize input so it is useful to the operator. The forms of the programs generally will determine how the information is to be formatted. For instance, a spread-sheet program yields numerical information arranged in standard manual spread-sheet form. A word processing program lets the operator work on alpha information in forms such as letters. An A/R program organizes work in accounts receivable, and so on.

The myth is that the computer will analyze these numbers or words. The operator has to know how to interpret the information to correctly use it. Some highly-sophisticated programs do analysis, but the type of programs to be reviewed next month don't lend themselves to that. So remember, this is a G-I-G-O system here: "Garbage-In-Garbage-Out." Putting the wrong information into the computer will yield the wrong information back. It might look nicer, but it will still be wrong.

A second myth is that people who use computers find extra time in the work week. In some cases, the work load is reduced (particularly if everything was done manually), but introducing a computer to a business has not generally yielded more free time. What usually happens is a reduction of work load when the machine is introduced. But it then levels off as the operator begins to put more information into the machine to process. Not time but more information is the product.

A third myth is that purchasing a computer will automatically make for a better company. Certainly, if computers are used correctly, a business can be helped immensely. But if the company had an ineffective system of controls to begin with, a computer shouldn't be expected to magically correct the problems.

Questions on computer systems

The most commonly-asked question about choosing a computer system isn't necessarily the most important for the long term. "What will it cost me?" doesn't deal with the problem. Here are some questions that should be asked before price.

1. How does your system presently work? A manual system can be transferred to a computer in some form. If a manual system is truly efficient, the assumption can be made that it will work on a computer.

2. What do you want to control? The most common first use of computers in the green industry is accounts receivable. Billings, aging of receivables and customer lists are most often better done on computers. Other functions might be inventory control, accounts payable, general ledger, routing, sales controls, marketing information, payroll, design capabilities, vehicle maintenance and personnel information. First, ask yourself what you want to control and then seek out a software vendor.

3. Who should I buy from? Each of the programs listed next month were written by reputable, knowledgeable companies. Certainly you should take the time to talk to more than one.

4. Do I have to buy hardware from the same company selling the software? In some cases yes, in others no. If the program is written to be PC-compatible, there is a wide choice. In other cases, the software is written for a specific machine and often the soft-

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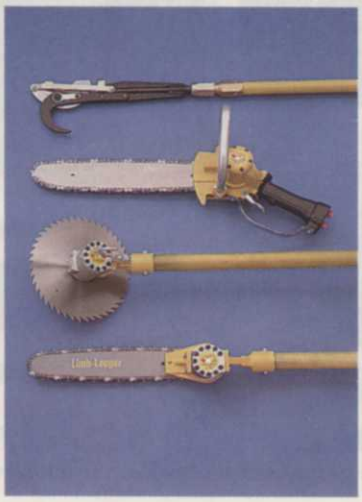

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ware vendor can supply the hardware as well as the software.

5. Are some hardware brands better than others? Generally not to any great degree. Brand-name machines may cost a little more, and they may carry with them a better resource if problems crop up.

6. How big a computer do I need? In order to answer this, owners should sit down and take a hard, long look at their companies. If substantial growth is expected, computer needs should be planned accordingly. If little growth is expected, the same applies.

Generally, a reputable software company will ask several questions to see if they are talking to a likely candidate for their programs. The key issue will be growth. The ability of the programs and hardware to grow with a company is a key factor.

7. Can I do everything on a personal computer? While this is close to question No. 6, it's not the same. Certain personal computers have fairly fast internal speed coupled with a large memory, generally in the form of a hard drive.

What should be avoided is a dual floppy computer, which a company of almost any size will find unusable. Several fine programs available for personal computers should be considered with the question above.

8. Should I buy generic or customized programs? It is better to work with programs that have industry-specific factors. Dozens of A/R programs are available, but they don't necessarily work the way the green industry likes to use them. By choosing a software company with some industry experience, owners have some assurance that they have designed programs with the right type of company in mind.

9. When should I buy my computer system? Most companies wait too long rather than the reverse. If staff is overworked, billing lags, inventory is confusing, or a business suffers any other major problems relating to information, a computer should be considered.

10. What do I have to know about computers to use one? Not much. The better the programming, the easier the machine is to use. Many people with "computer apprehension" fail to buy a computer system because of visions of large unmanagable machines. This is not true in the case of the programs we reviewed. They were all usable by someone who had little or no basic knowledge of computers.

Owner/operators must have easy access to information in forms that will help them manage their companies better.

11. How long will it take me, or my staff, to learn to use the computer? This varies, but generally the types of programs we reviewed could be learned within a week and then would become comfortable after about a month.

12. How will I learn to use the computer? Either by on-site visits from the progammers, phone assistance, or the manuals. It's really not that tough once you start.

13. Finally, what will it cost? Several components go into the cost of a computer system. Hardware, software, peripherals and the support system all have costs associated with them. An owner has to assess what he or she wants the computer to do, then check on the available options. Some people might want to look up some computer magazines and find articles on peripherals, for example, to get a working idea of the available products.

The general answer to the cost question is that the computer package will probably run somewhere between $5,000 and $20,000, depending on size. They can get a lot more expensive, but that is the general range of prices of programs we reviewed. The key is to question more than one vendor so a comparison base can be determined. Some answers will confuse some people. The only protection is to understand—not computers—but what they can do.

Remember in computer shopping that the companies themselves are better at describing the specific parts of their program than we can next month in our program appraisals. They will be better able to answer any questions on individual issues. Before buying, a check should be made of the support system: what it costs, how it's done and who will be doing it. This is an additional cost in some cases but may be well worth it.

Finally, a choice should be made based on needs and personal relationships with suppliers. The astute owner would call several so that he or she could begin to make comparisons.

All the programs we will be reviewing next month were logically written, and each of them had special features unable to fit into short reviews. A final decision should be made based on the costs, the machines, the features of the programs and—most importantly—on how individual owners feel about answers to any questions.

Many of the companies listed visit major national conventions to demonstrate software. By taking time to make a decision, a system should be purchased that fits both the present and future needs of the company. These systems will help the company be more effective and profitable in the future. **LM**

In November, LANDSCAPE MANAGEMENT will look at software programs available to the green industry.

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1837-1987 150

Circle No. 111 on Reader Inquiry Card

Water is the most abundant compound in the world. It is also taken for granted—until its quantity or quality becomes scarce. Recently, drought conditions in parts of the country have severely limited maintenance of turfgrass quality. These experiences have made turfgrass managers more aware of the critical need to effectively manage water supplies. The following article is the first in a series which will cover information presented at the 25th Nebraska Turfgrass Conference.

The authors have considerable experience and expertise relating to turfgrass water quality and quantity, water use and drought resistance.

Some of this information is technical by the very nature of drought resistance in plants. Drought stress is complex and involves a number of interactive factors. However, turfgrass managers should not despair, as you will read this month and in following months.

PART I OF IV

WATER: AN ENDANGERED HERITAGE

H_2O: How can we use it wisely, share it fairly, and still maintain its quality?

by A. E. Dudek, Ph.D., University of Florida

Water is something everyone seems to take for granted. It is cause for concern only during times of scarcity. Yet it is the most abundant chemical compound in the world. It is a major constituent of all living organisms. Without water, life would cease to exist.

It is used in most agricultural and industrial processes. But most importantly, there is no substitute for water, even in this age of high technology. A person can survive one week without food, but only three days without water.

Conversion of water into plant dry

continued on page 58

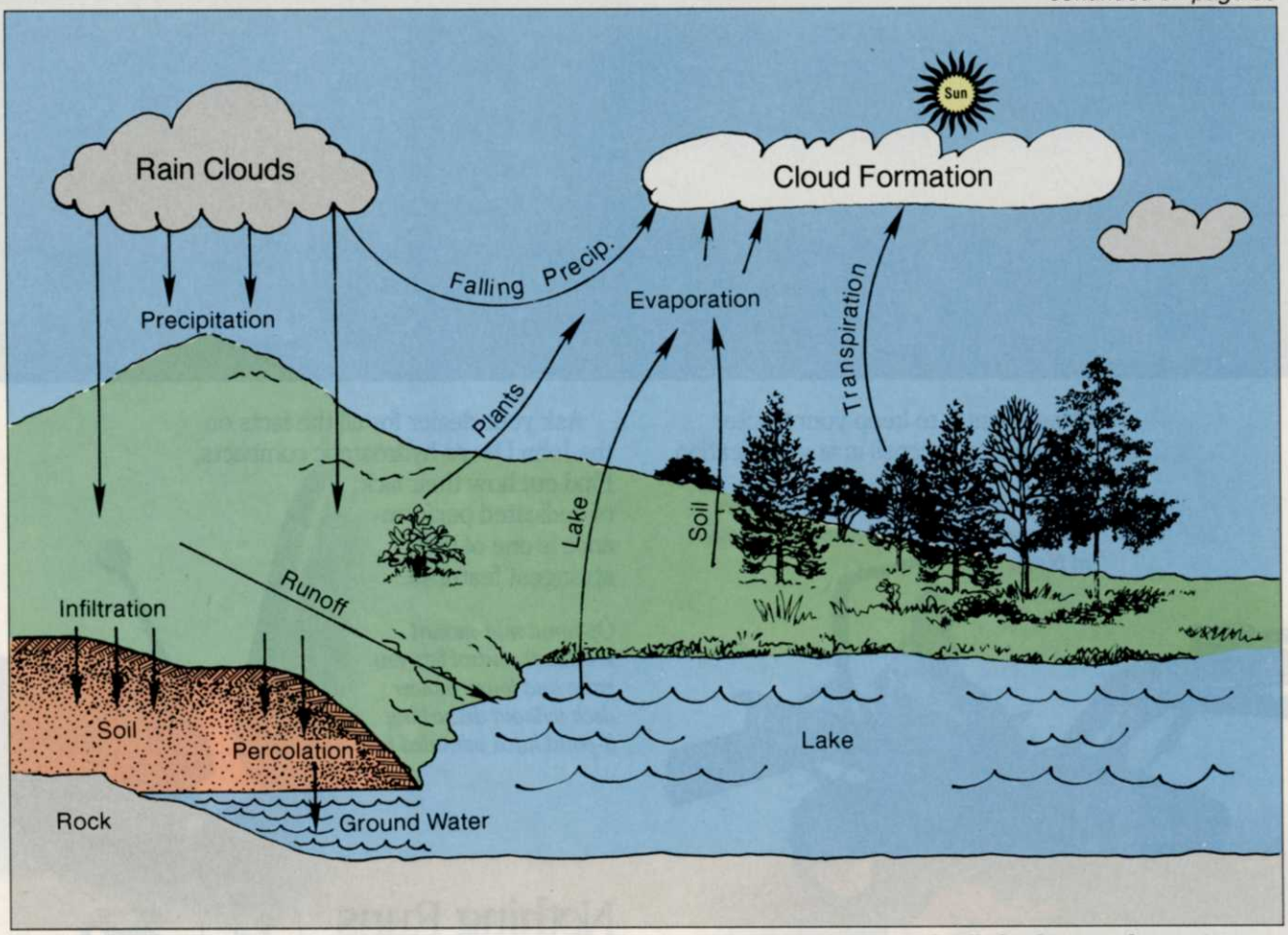


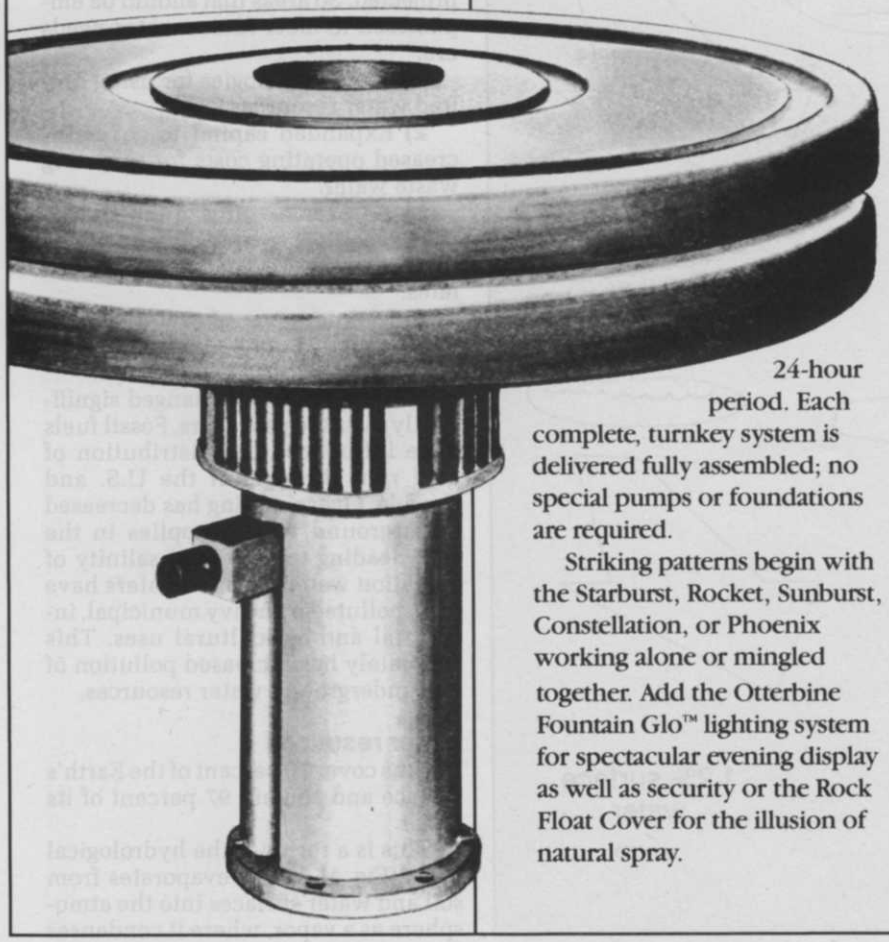
Figure 1. Hydrologic Cycle - Moisture is recycled through evaporation, condenses and falls back to earth as rain, sleet, hail, snow, dew and fog.

Troubled waters?

Otterbine Aerators

The prescription for troubled breathing, poor circulation, and changing temperatures in ponds and lakes is practical engineering that is esthetically pleasing.

These aerators range in power, circulating from 600,000 to 20 million gallons of water in a 24-hour period. Each complete, turnkey system is delivered fully assembled; no special pumps or foundations are required.



Striking patterns begin with the Starburst, Rocket, Sunburst, Constellation, or Phoenix working alone or mingled together. Add the Otterbine Fountain Glo™ lighting system for spectacular evening display as well as security or the Rock Float Cover for the illusion of natural spray.

Otterbine Aerators meet the water management needs of golf courses, parks, recreational lakes, office developments, and residential condominiums. Call or write for more information:

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OTTERBINE BAREBO, INC.

Circle No. 103 on Reader Inquiry Card

matter is very inefficient. Botanists say that 1000 pounds of water (approximately 120 gallons) is needed to produce one pound of plant dry matter. Industrial needs also have great demands for water, requiring 200 gallons to produce a pound of rubber, 30 gallons to produce a pound of paper, and 18 gallons to produce a pound of steel.

Furthermore, agricultural and industrial demands on water are heavily impacted by human needs, which in many cases are very wasteful. On the average, we use 25 gallons of water for a shower, 16 gallons to run the dishwasher, three gallons to flush the toilet, but only five to six pints for body functions.

Water crisis

Today, most people are unaware of a water crisis which involves quality and quantity. This crisis is a result of increased demand on a constant supply. Worse yet, we have contaminated and continue to pollute our present resources.

Average annual precipitation in the United States is 30-60 inches per year in the humid East to 10-30 inches in the dry West.

It has been estimated that, if we continue to increase use of fossil fuels at the present rate of four percent per year, the mean global temperature will increase by two degrees Celsius by the year 2000 and seven degrees by the year 2050. This temperature increase may not seem much, but it would make North America significantly drier than it is today. The drying trend would magnify our future water needs.

One researcher says that, "for the next generation of Americans, water—its competing uses and conflicts that arise out of those uses—may be *the* most critical national problem."

Since the amount of available water is fixed, and water needs multiply with population and industrial growth, how can we use it wisely, share it fairly, and still maintain water quality?

Most people are unaware of a water crisis which involves quality and quantity.

The U.S. Water Resource Council predicts that our 1980 water requirements for municipal, industrial and agricultural uses of 443 billion gallons of water per day (bgd) will nearly double to 805 bgd by the year 2000 and triple to 1,386 bgd by the year 2020. A gloomy outlook for water has been projected. So areas that should be emphasized to meet future water needs are:

1) New technologies for using limited water resources.

2) Expanded capital to cover increased operating costs for recycling waste water.

3) Awareness of a quantitative water shortage in the Southwest, and that other states will share similar fates.

4) Maintenance of water *quality* being equally or more important than *quantity*.

Water quality has changed significantly over the past years. Fossil fuels have influenced the distribution of acid rain throughout the U.S. and Canada. Overpumping has decreased underground water supplies in the U.S., leading to increased salinity of irrigation water. Surface waters have been polluted by heavy municipal, industrial and agricultural uses. This ultimately has increased pollution of our underground water resources.

Water resouces

Oceans cover 70 percent of the Earth's surface and contain 97 percent of its water.

This is a result of the hydrological cycle (Fig. 1). Water evaporates from soil and water surfaces into the atmosphere as a vapor, where it condenses

Continued on page 60

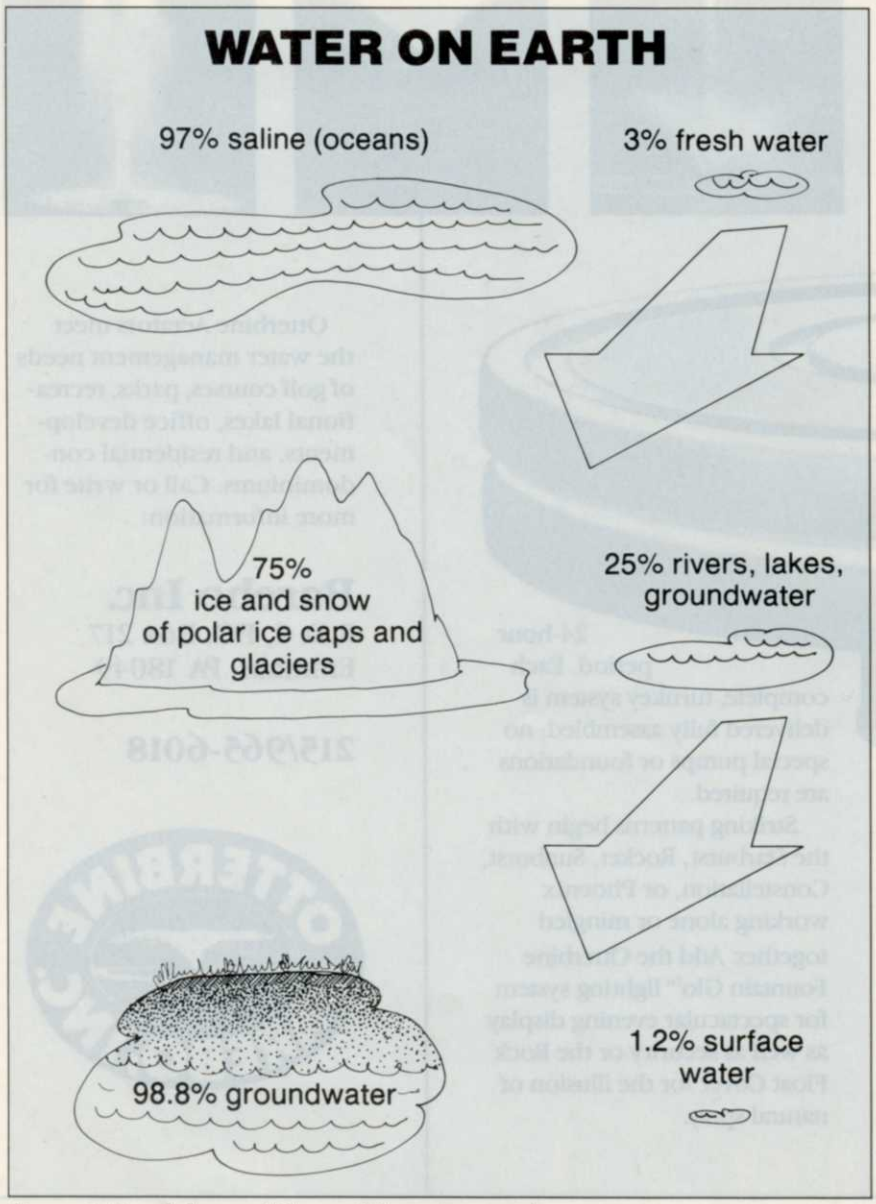

Figure 2. Breakdown of the earth's water supply.

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one single application does the work of two.

Isn't it time you quit wasting time and money on separate fungicides for your turf and ornamentals? This year let DUOSAN provide safe and effective broad-spectrum disease control of 17 major diseases on turf, trees, flowers, and shrubs.

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Available in 2 lb. bag, 6/case.

Circle No. 125 on Reader Inquiry Card

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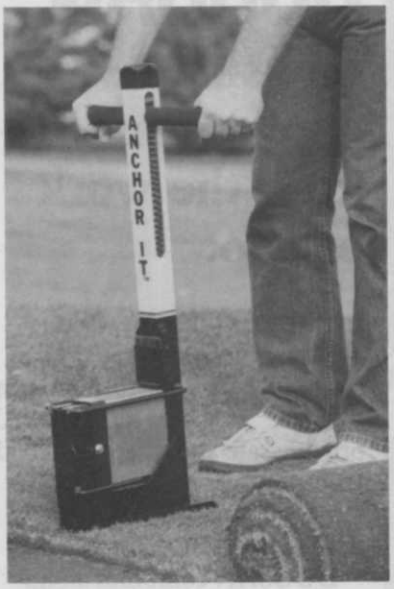

Save Time, Money and Back-Breaking Labor.

- Firmly anchors sod & turf covers — even on steep slopes.
- Sturdy cast aluminum construction is lightweight for easy use (weighs approximately 10 lbs.)
- Holds up 50 anchoring staples.
- Steel staples may be removed from the ground at a later date or left in place. Staples will rust away with time.

Anchor It can save enough time by speeding up your anchoring operation to pay for itself in a very short time — and make your work easier as well.

Anchor It works fast. . . **Anchor It** holds fast.

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Phone: (319) 266-2638

Circle No. 141 on Reader Inquiry Card

WATER *from page 58*

as rain or snow which falls back to the ground as precipitation. Free water then percolates through the soil, picks up dissolved minerals, and carries them back to the ocean by means of streams and rivers. This cycle is continuous, and is why the oceans of the world are as salty (saline).

Only three percent of the Earth's water supply is fresh (non-saline). Of this three percent freshwater, 75 percent is trapped as ice and snow in polar ice caps and glaciers. Only 25 percent is found in rivers, lakes and groundwater. The 25 percent is further broken down to only 1.2 percent surface water with the remaining 98.8 percent as groundwater. Oceans are being used as a water source by desalination, but this process is costly.

Present-day water resources involve wells, rivers and streams, and effluent. Well water was once a relatively constant source of stable, good quality water, free of toxic materials and pest problems. But overpumping and groundwater contamination have caused serious environmental concerns with this water source. Rivers and streams are also polluted because of surface runoff.

Effluent may be the turfgrass industry's salvation.

Recycled effluent

Increased population goes hand-in-hand with increased waste. On the average, each person produces 70-100 gallons of waste water and .25 pounds of sewage sludge daily. Thus, 400 gallons of polluted water are produced with every pound of organic matter transported to the nearest sewage treatment plant.

Water recycling will become the rule rather than the exception, and turf would be a *natural* for recycling effluent water.

Turf is a perennial ground cover that grows most of the year, in contrast to annual agronomic or horticultural crops. Turf has a high water requirement. Most importantly, turf is an urban commodity that is used close to the source of effluent supply. Wastewater is used on a turf ground cover for plant uptake, evapotranspiration into the atmosphere, and percolation into the ground where it is filtered and then purified by soil microbes. Thus, benefits of wastewater irrigation are several:

1) Inexpensive source of water.

2) Save potable water for other purposes.

3) Urban greenbelt areas for recreation.

4) Economic returns on crop sales.

5) Positive alternative to advanced wastewater treatment and surface water discharge.

Depending on the degree of wastewater treatment and availability, some states require the use of recycled water for turf irrigation instead of potable water.

Gray water

Gray water is a relatively new idea being used in new housing developments.

Forty percent of the average household's wastewater comes from the toilet, 30 percent from the bath and shower, 15 percent from the laundry, 10 percent from the kitchen and 5 percent from other sources.

The gray water concept isolates the toilet water from other household water. Only toilet water with its organic matter is connected to sewage lines for transportation to a sewage treatment plant where it undergoes normal processing. Thus, processing at the treatment plant is reduced 60 percent because the remaining sources of water are collected, treated and recycled at the home. Gray water is used for washing automobiles, watering landscapes, etc. Also, this water may be recycled back to the bathroom where it can be used in the toilet to further reduce our demands on potable water.

For the next generation of Americans, water may be the most critical national problem.

The future

The 1972 Federal Water Pollution Control Act amendments set a national goal of eliminating discharge of pollutants into navigable waters by 1985. We've made a lot of progress to date, but we still have a long way to go. Unfortunately, the Clean Water Bill has not yet been resolved in Congress.

Obviously, a master plan involving federal, state and local water planning groups is needed to analyze our existing and future needs. All water-related industries must be protected. During times of water shortages, turf facilities are the first to be restricted. Water priorities must be set based on essential, critical needs which are fair to all concerned.

Water is our most precious resource. Be careful how you use it. **LM**

OTF Plan now to attend.

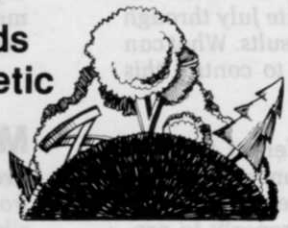
Dec. 7-10, 1987
The Ohio Center
Columbus, Ohio

The Ohio Turfgrass Foundation Conference and Show features lectures, workshops and more than 350 exhibits for lawn care, golf course, landscape and grounds maintenance professionals.

Golf Course

- Understanding Poa to Bent Conversion with TGR
- Experiences with *Poa annua*— Its Management and Control from a Plant Pathologist's Viewpoint
- Management of Localized Dry Spots
- The Pros and Cons of Disease Detection Kits
- Putting Green Management
- Insecticides — Recent Developments
- Golf Course Computers — Utilization and Cost
- Personal Financial Planning
- Stress Management
- Wildflower and Native Grass Renovation
- Chemical and Biological Control Strategies for Aquatic Management
- Greens Reconstruction — Making It Right!
- Bentgrass Fairway Management— Are We Headed in the Right Direction?
- Thinking Superintendent — Time and Money-Saving Ideas
- Soil Management — Facts and Fallacies
- The Black Layer — Sifting Through the Maze
- Greens Reconstruction
- Bentgrass Breeding
- Overseeding Turfgrasses
- PGRs for *Poa annua* control

Grounds & Athletic Fields



- Ground Covers — Alternatives to Grasses in the Landscape
- Wildflower and Native Grass Renovation
- Aquatic Management Strategies for Small Ponds
- PGRs as a Tool for the Professional Grounds Manager
- Annual and Perennial Selection and Care
- Turf-Type Tall Fescues
- Insecticides — Recent Developments
- Stress Management on the Job
- Selecting the Proper Aeration Equipment
- Pre-emergent and Post-emergent Herbicides — Recent Developments
- Soil Management in the Landscape — Facts and Fallacies
- Low Budget Athletic Fields
- Player Safety/Field Quality
- The Agronomics of Athletic Field Management — A Reevaluation
- Soil Management of Athletic Fields
- Experience with Turfgrass Aeration Equipment
- A Morning with George Toma

Lawn Care

- Ecology of Patch Diseases
- The Pros and Cons of Disease Detection Kits
- Patch Disease Research Update
- Why Pre-emergent Herbicides Fail
- Why Post-emergent Broadleaf Herbicides Fail
- Drift and Pattern Displacement of Pesticides
- Core Cultivation Effects on Pre-emergent Herbicide Efficacy — Another Look
- Considerations and Selection of Core Cultivation Equipment
- Soil Improvement and Management — Physical or Chemical?
- Pre-emergent and Post-emergent Herbicides for the Lawn Care Professional
- The Pros and Cons of Turf-Type Tall Fescues
- Reducing Pesticide Usage Through Agronomic Practices
- Experiences with PGRs in the Landscape
- Insecticides — Recent Developments
- Alternatives to Pesticides
- Maximizing Job Satisfaction

Workshops

- Insurance Liability — Insuring the Landscaping and Lawn Care Risk
- Guidelines for Estimating Maintenance and Landscape Work
- Annual and Perennial Flowers
- Understanding and Interpreting Water Quality Related to Irrigation
- Pesticide Safety and Use

Ohio Turfgrass Foundation

Anyone involved in turfgrass or ornamental management is invited to attend the Ohio Turfgrass Foundation Conference and Show. For complete information and a conference program, contact:

Dr. John Street
c/o Ohio Turfgrass Foundation
2021 Coffey Road
Columbus, OH 43210
(614) 292-2601

Circle No. 132 on Reader Inquiry Card

PROBLEM MANAGEMENT

by Balakrishna Rao, Ph.D.

Controlling spruce gall

Problem: *How do you control gall problems on spruce? We have had problems in controlling the galls which form at the base of small branches. We have used Sevin in the past around late July through early August and haven't had good results. What can be used, and when is the best time to control this particular pest? (Pennsylvania)*

Solution: Spruce plants get two different types of galls caused by adelgids, most commonly referred to as spruce gall aphids. To manage these problems it is important to identify the adelgids properly to provide chemical control at specific times.

The Cooley spruce gall adelgid produces pineapple-type galls at the tip of branches. To manage this gall problem, treatments should be done after galls open in late July or early August, or before buds start to break in the spring (approximately early April). The Sevin treatments you have been using will do a good job in managing this problem when applied at the proper time.

The other kind of galls are called the Eastern spruce gall adelgids which have a slightly different activity period. This may explain why you are having control problems. To manage these galls, treat the plants after galls open in middle to late September or before buds start to break in the spring.

For both gall problems, several products—malathion, Thiodan, Sevin, Systox or Dursban—can be used in the spring. Make sure to apply the treatments at the proper time when galls open. Timing is probably the most important factor in many pest management approaches. Read and follow label specifications for best results.

Managing maples

Problem: *A number of maples in our area are suffering from some problems. The problems are seen on red, silver, Norway and sugar maples. Most trees have a starved look with yellow leaves and some green veins. The problems appear to be related to some sort of nutrient deficiency. In your opinion, what seems to be the problem and what can be done? (New York)*

Solution: Based on your field observation of symptom pattern, the problems you are experiencing appear to be related to nutrient deficiency. Maples, in general, suffer from manganese deficiency. When maple trees do not absorb sufficient manganese, the foliage becomes yellow between the veins which remain green. If the problems are severe, the tissues between the veins turn brown, especially on the younger, outermost foliage with some defoliation. Manganese deficiency has been observed on different species of maples, such as red, silver, Norway and sugar.

Take Aim on Crabgrass and Goosegrass with

ACCLAIM!® 1EC Herbicide Brings High Technology Down to Earth!

Acclaim is the only truly selective postemergence herbicide that eliminates warm season grassy weeds in cool season turf grasses.

New Chemistry for Superior Performance!

Acclaim translocates from the site of contact to the heart of weed growth – cleanly decomposing the entire weed after 21 days. Acclaim has no residual soil effect, and avoids the turf injury problems associated with other postemergence herbicides.

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Solution: Symptoms of manganese deficiency on maple would be similar to iron deficiency on pin oak. Therefore, ideally the plants showing yellow foliage should be tested for nutrient deficiency. Both a soil test and foliar analysis would be necessary to provide corrective measures.

Contact your county extension service for further information concerning deficiency tests. It is important to get the tests done prior to treating. Reports indicate that if maples are treated with iron rather than manganese, the symptoms become more severe because iron can further suppress manganese uptake due to an iron/manganese antagonism. In most cases, manganese deficiency is associated with alkaline soils.

Lowering the soil pH with applications of sulfur may release the manganese in the soil, although results vary and may not be satisfactory. The trunks of manganese-deficient maples can be injected with manganese sulfate or implanted with capsules of the same material. Treatments should be done just prior to the spring flush of growth for best results.

Following Roundup applications

Problem: *We are interested in using our lawn care tanks and spray units for spraying Roundup after cleaning. After Roundup application and cleaning, we would like to use the spray equipment for normal production. Is this possible? If yes, would you comment on the proper way to safely clean the tank? We are concerned with the potential of Roundup residue causing injury. (New York)*

Solution: Yes, it is possible that you can use the lawn care spray units for spraying Roundup. I believe you will be using a 1 percent solution of Roundup to manage the weeds. After using Roundup, it is important to drain the system and flush it with water to clear the entire spray system. Generally, cleaning with water alone is sufficient to rinse the residue from 1 percent solution. Make sure to clean the bottom and sides of the tanks to get rid of any residues. After cleaning, the tanks can be reused for regular lawn care spraying. Always read and follow label specifications and manufacturers' guidelines about the safety and material handling and disposal of pesticides.

Balakrishna Rao is Director of Lawn Care Technical Resources for The Davey Tree Co., Kent, Ohio.

Questions should be mailed to Problem Management, Landscape Management, 7500 Old Oak Boulevard, Cleveland, OH 44130. Please allow 2-3 months for an answer to appear in the magazine.

1EC HERBICIDE

One Application Does It!

When applied thoroughly to non-drought-stressed grassy weeds from 3 leaves to 3 tillers in size, chances are once is all you'll need!

Apply to fine or tall fescue, perennial ryegrass, and Kentucky bluegrass.

Take Aim on crabgrass, goosegrass, barnyard grass, foxtail species, Panicum species and Johnson grass.

Reseeding and Mowing Convenience!

Fescues and ryegrass can be overseeded immediately following Acclaim application. Bluegrass can be overseeded after 21 days. And mowing just 24 hours after Acclaim application won't reduce efficacy.

Great Turf Deserves Acclaim!

As a professional, you take pride in having and maintaining lush green turf throughout the season. Acclaim can help you get the acclaim you deserve!

For information, contact your distributor or your local Hoechst-Roussel Agri-Vet Company representative.

Hoechst Roussel

Circle No. 120 on Reader Inquiry Card

Control wild garlic with fall applications

What's more irritating to someone paying for weed control than the sight of wild garlic poking up through dormant grass? Perhaps only having to apply and re-apply herbicides during the season to keep the weed under control.

The wild garlic that poses a problem to homeowners and professional turf managers can create a profit for professional turf managers. When offered as an add-on service to customers, wild garlic control can boost fall revenues.

The program is simple. As lawns are treated during the spring and summer, scout for wild garlic.

When fall approaches, point out the weed to customers. Explain that—because wild garlic isn't a problem in every yard—treatment is offered on an as-needed basis.

Remind customers of the irritating, unsightly green sprouts that stick up through the uniformly brown lawn all winter. Then let them know that wild garlic can now be controlled with a new, environmentally sound product.

G. Euel Coats, Ph.D., and former graduate student Doug Anderson check plots they treated to define the purple nutsedge and wild garlic activity of Image herbicide.

Image herbicide, from American Cyanamid, has been proven effective against wild garlic on warm-season turfgrasses in a single application.

Bob Deems, a Ph.D. who is in

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A GREAT TRAILER for TURF MANAGEMENT!

There is a Capacity to Fill Your Needs from 1-Ton to 5-Ton

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Circle No. 145 on Reader Inquiry Card

charge of turf research at American Cyanamid, explains what customers should expect from an application:

1. One treatment provides essentially year-long control.

2. Image works very slowly. Expect to have wild garlic showing for some time, even weeks, after treatment.

3. If mowed two weeks after treatment, wild garlic won't grow any taller, so it won't be as unsightly as untreated weeds.

November applications of Image have provided 80 percent or better control of wild garlic, according to G. Euel Coats, Ph.D., scientist and professor with the Mississippi Agriculture and Forestry Experiment Station at Mississippi State University.

Coats has tested the product on golf courses and university plots. He reports consistent control of wild garlic and notes reduced populations in the year following a single application.

"Image should be applied after the warm-season turfgrass is dormant, and while wild garlic is actively growing. Pre-emergence applications are not effective," Coats says. "Above-ground shoots stop growing above the turf two to three weeks following application. However, in some tests, control wasn't apparent for six or seven weeks.

"Wild garlic control with Image herbicide is definitely better than with 2,4-D or combination products we've been using," Coats notes.

Ray Dickens, Ph.D., professor of turf management at Auburn University, has also researched wild garlic control.

These plots, treated with Image herbicide in November 1985, show control 16 months after treatment.

"We've tested Image on four of the major southern turfgrasses, Bermudagrass, zoysiagrass, St. Augustinegrass and centipedegrass. All four tolerated it very well," Dickens says.

"In most cases, if you can control wild garlic before it forms reproductive stems, or bulblets, you can reduce populations in subsequent years," explains Dickens. "Image is a viable alternative to the phenoxies in a lot of situations."

Image, registered for use on fine turf earlier this year, is part of a new chemical family. Easily absorbed by most plants, Image moves throughout the plant, including the roots.

It inhibits production of a vital plant enzyme necessary for growth. Weeds stop growing within hours of application, then use up food reserves and die.

Warm-season turf species are able to metabolize the product before it causes damage. Image is registered for use on Bermudagrass, zoysiagrass, centipedegrass and St. Augustinegrass. The active ingredient, imazaquin, is essentially non-toxic to mammals, fish, birds, insects and soil organisms. **LM**

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The only sweepers with unique all-vacuum design that operate on both turf or pavement, wet or dry. Safe, powerful air picks up bottles, cans, as well as fine clippings to reduce thatch build-up.

- Sweeping widths from 4′ to 30′.
- 6″ × 10′ hand intake hose available.
- Hard surface filtration.
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MODEL FM6 PTO. Fast, powerful sweeper tows behind PTO tractor. Vacuums up bottles, pine cones, heavy thatch. Sweeps 60" wide. Hopper capacity 5 cu. yds. unmulched material. Ground dumps.

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Sweeps 54" wide. Self-propelled, 2 cu. yd. ground dump hopper.

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TORNADO TRUCK LOADER
Super vacuum powered by 30 hp engine. Scoop or pick-up hose.

PRODUCTS

Flood bubbler nozzle installs on pop-ups

Toro's new PC Flood Bubbler nozzle can be installed on a pop-up sprinkler. It takes advantage of pop-up features

like safe ground-level installation and smooth retraction when not in use.

The nozzle allows even flow of water from 30 psi to 75 psi, with no effect on performance from lateral line friction loss. The PC Flood Bubbler is available in ¼, ½ and 1 gallon-per-minute flow sizes.

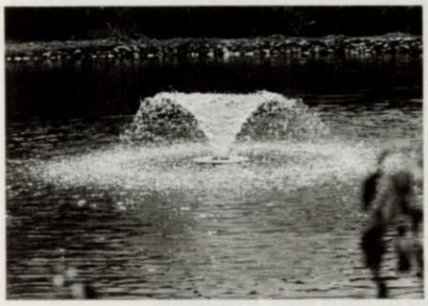
Circle No. 195 on Reader Inquiry Card

Water aerator line gets product entry

Barebo has added the 175 Sunburst model to its product line of floating mechanical aerators.

This latest Otterbine comes equipped with 50 ft. of underwater power cable and a standard 115-volt plug.

The 175 Sunburst was designed for use in small water settings. It needs a minimum operating depth of just 13 in. A spray pattern of five feet in diameter may be obtained. Ideal for small ponds with landscape architecture applications, the 175 Sunburst provides aesthetic water quality management.



Circle No. 196 on Reader Inquiry Card

Power mulcher can throw 1½ tons of mulch per hour

The TM-Jr. portable power mulcher from Reinco, Inc. is powered by a Kawasaki 8.5 hp air-cooled gas engine, and can blow hay or straw mulch at a rate of 1½ tons per hour to distances of 35 feet. With an optional flexible hose, that range can be increased to 100 feet.

The introductory price of the TM-Jr. is $4000.

Circle No. 197 on Reader Inquiry Card

The Advanced System for

Billy Goat's TR Truck Loader System is a complete lawn maintenance system that makes fall leaf cleanup easy. Call us today and find out how your lawn service crew can use these four pieces of equipment to clean up in record time.

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Use the backpack blower to remove debris from shrubs and hard-to-reach areas.

The suction sweeper is used for sweeping up leaves in outlying areas, away from the truck.

Absorbent sock system contains hazardous spills

The Haz Mat Pig from the New Pig Corporation, is an absorbent sock which sucks up and contains hazardous material spills. The system is designed to replace old methods of using loose clay to contain spills.

According to the company, a bucket of six pigs will absorb five gallons of acids, caustics or flammable solvents within five minutes. The saturated pigs can be returned to their resealable polyethylene bucket for temporary storage.

Circle No. 198 on Reader Inquiry Card

Four-wheel drive moves mower on steep terrain

The F2000 front mount mower from Kubota is designed for commercial use with a 20 hp diesel engine, four-wheel drive and rear wheel power steering. The four-wheel drive coupled with a front differential lock gives stability and traction on steep terrain.

A 60-inch mower is standard, with a 72-inch optional. The mower is

lifted hydraulically, with cutting heights from 1.5 to 4.0 inches. Independent front brakes allow for zero turning radius at mowing point by applying one brake.

Safety features include a safety start switch, a roll-over protective structure and a seat safety device which automatically shuts off the engine if the driver leaves the seat with the engine running.

Circle No. 199 on Reader Inquiry Card

Portable computer sensor monitors turf water needs

The ST27 from Standard Oil Engineered Materials Company allows a golf course superintendent to base watering decisions on turf's actual water needs, reducing costs and preventing over- or under-watering.

The infrared thermometer measures turf temperature, sensors measure air temperature, humidity and solar radiation. A shoulder-pack computer calculates water needs based on these factors.

The monitor can maintain records for 135 areas on a golf course, sufficient information for 27 golf holes. Data can be transferred to a personal computer easily for permanent filing.

Circle No. 200 on Reader Inquiry Card

Lawn Maintenance

The TR Truck Loader System

Use the heavy duty wheeled blower to move large quantities of leaves toward the truck.

The intake hose vacuums leaves piled up around the truck and sends them through the four-bladed steel impeller in the truck loader. By crushing leaves and debris into small particles, the impeller greatly reduces bulk. This allows the truck to hold more debris and prevents operators from having to unload the truck as often.

Circle No. 104 on Reader Inquiry Card

BOOKSTORE

345 - COST DATA FOR LANDSCAPE CONSTRUCTION 1987
Kathleen W. Kerr, Editor
An updated unit cost data reference for designers and cost estimators. Developed to fill the tremendous need for detailed landscape construction cost data. Laid out in easy-to-use CSI format. Annual
$32.00

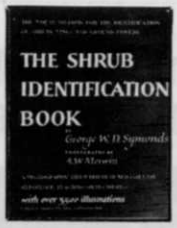
350 - HANDBOOK OF LANDSCAPE ARCHITECTURAL CONSTRUCTION
edited by Jot Carpenter
A practical how-to reference on landscape construction. Published by the Landscape Architecture Foundation, the book carries the expertise of more than 25 landscape professionals. **$45.00**

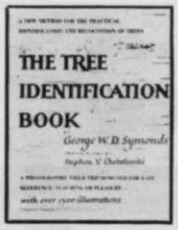
300 - LANDSCAPE DESIGN: A PRACTICAL APPROACH
by Leroy Hannebaum
Geared for the commercial designer/salesperson, this is a one-stop guide to the landscape design process. Covers the entire highly competitive field including design analysis techniques, pointers on land forms, specialized business landscaping methods, environmental design guidelines, specifications, estimations, bids. **$33.95**

370 - LANDSCAPE OPERATIONS: MANAGEMENT, METHODS & MATERIALS
by Leroy Hannebaum
An in-depth examination that combines technical training in landscape science with methods of accounting, business management, marketing and sales. Discusses effective methods for performing lawn installations, landscape planting and maintenance. Step-by-step accounting calculations are explained in simple terms. **$31.95**

365 - LANDSCAPE PLANTS IN DESIGN
by Edward C. Martin
An annotated photographic guide to the design qualities of ornamental plants and their aesthetic and functional use in landscape designing. Over 600 trees, shrubs, vines, ground covers and turfgrasses are described in nontechnical language. Over 1900 photographs. Provides a basis for selecting the best plant materials for any particular use in landscape design. Contains detailed indexes that provide quick reference to particular design qualities and growing conditions. **$55.00**

375 - RESIDENTIAL LANDSCAPES
by Gregory M. Pierceall
An excellent reference for individuals involved in the design and development of plantings and constructed features for residential sites. Illustrations and actual residential case study examples are used to communicate graphic, planning and design concepts which are the focus of this text. **$36.95**





665 - ARBORICULTURE: THE CARE OF TREES, SHRUBS AND VINES IN THE LANDSCAPE
by Richard W. Harris
Provides comprehensive coverage of complete planting, site analysis, preparation and special planting methods, fully detailed coverage of fertilization, irrigation and pruning guidelines on preventative maintenance, repair and chemical control, how-tos of diagnosing plant problems, practical data on non-infectious disorders, diseases, insects and related pests and pest management. **$47.95**

720 - SHRUB IDENTIFICATION
by George Symonds
Pictorial key to identify shrubs. Contains more than 3,500 illustrations to check specimens. Popular and botanical names are given for each shrub and handy index tabs for quick reference.
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750 - TREE IDENTIFICATION
by George Symonds
Pictorial reference to identifying trees by checking leaves, buds, branches, fruit and bark. Like its sister publication. SHRUB IDENTIFICATION, popular and botanical names are listed with index tabs for easy reference.
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760 - TREE MAINTENANCE
by Pascal Pirone
The fourth edition of this guide for anyone involved in the care and treatment of trees. Special sections on tree abnormalities, diagnosing tree troubles, non-parasitic injuries and assessing the suitability of different trees. **$49.95**

565 - WEEDS
by Walter Muenscher
Second edition. Premier text for identification and basic natural history for seeds found in the continental United States and Canada. Ecological data on weed biology combined with excellent keys and plant descriptions make this an essential reference book.
$39.95

405 - WOODY ORNAMENTALS
by Partyka, Joyner, Rimelspach, Carver
Illustrates plant identification characteristics. Organized in two basic sections: plant identification and plant disorders, this text utilizes 430 color photos, 430 line drawings and 45 black and white photos to simplify identification.
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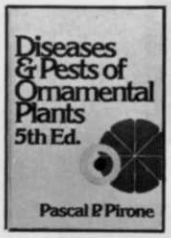

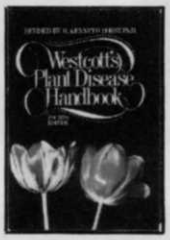

410 - DISEASES & PESTS OF ORNAMENTAL PLANTS
by Pascal Pirone
This standard reference discusses diagnosis and treatment of diseases and organisms affecting nearly 500 varieties of ornamental plants grown outdoors, under glass or in the home. Easy to understand explanations of when and how to use the most effective fungicides, insecticides and other control methods. **$34.95**

690 - INSECTS THAT FEED ON TREES AND SHRUBS
by Johnson and Lyon
Essential information for identifying more than 650 insect pests and the injuries they cause. More than 200 color illustrations. **$49.50**

570 - WESTCOTT'S PLANT DISEASE HANDBOOK
by Kenneth Horst
This fourth edition offers professionals the latest diagnostic and disease control information. Plant entries designed to simplify diagnosis, plus background on the classification of plant pathogens. This handbook gives a specific description of each disease, susceptible plants, specific symptoms of the disease, reported locations and control measures for each disease and their side effects.
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EVENTS

OCTOBER

National Roadside Vegetation Management Association Annual Meeting, Oct. 6-8, Louisville, Ky. Contact: T.J. Hernandez, NRVMA, 309 Center Hill Rd., Wilmington, DE 19807; (302) 655-9993.

Florida Turfgrass Conference, Oct. 11-14, Hyatt Regency Hotel and Curtis Hixon Convention Center, Tampa, Fla. Contact: Florida Turfgrass Association, 302 S. Graham Ave., Orlando, FL 32803-6332; (305) 898-6721.

Tree Biology Workshop, hosted by Alex Shigo, Oct. 13-16, Portsmouth, N.H. Contact: Robert Felix, National Arborists Association, 174 Rt. 101, Bedford, NH 03102; (603) 472-2255.

International Irrigation Exposition and Technical Conference, Oct. 25-28, Orange County Convention Center, Orlando, Fla. Contact: Mark Williams, The Irrigation Association, 1911 N. Fort Meyer St., Suite 1009, Arlington, VA 22209; (703) 524-1200.

November

Turf and Landscape Disease Short Course, San Jose, Calif. (Nov. 4, 18), Foster City, Calif. (Nov. 4, 18), Walnut Creek, Calif. (Nov. 5, 19). Contact: Dr. Ali Harivandi, University of California Cooperative Extension, 224 West Winton Ave., Room 174, Hayward, CA 94544; (415) 670-5200.

Texas Turf Irrigation Association and Texas Association of Landscape Contractors Trade Show and Convention, Nov. 5-7, San Antonio (Tex.) Convention Center. Contact: Buddy Richard, Texas Turf Irrigation Association, 940 E. 51st St., Austin, TX 78751-2241; (512) 454-8626.

Green Team Conference, Nov. 7-11, Hyatt Regency Crystal City, Arlington, Va. Contact: ALCA, 405 N. Washington St., Falls Church, VA 22046; (703) 241-4004; or PGMS, 12 Galloway Ave., Suite 1E, Cockeysville, MD 21030; (301) 667-1833.

California Landscape Contractors Association, Nov. 8-11, Krystal Vallarta Hotel, Puerto Vallarta, Mex. Contact: Larry Rohlfes, CLCA, 2226 K St., Sacramento, CA 95816; (916) 448-2522.

Penn State Golf Turf Conference, Nov. 9-11, Keller Conference, Center, University Park, Pa. Contact: Dr. Joe Duich, 21 Tyson Bldg., University Park, PA 16802; (814) 865-9853.

Missouri Lawn and Turf Conference, Nov. 9-11, St. Louis Chase-Park Plaza Hotel. Contact: Craig White, Office of Conferences, 344 Hearnes Bldg., UMC, Columbia, MO 65211.

Alliance for Environmental Concerns Annual Meeting, Nov. 13, Forsgate Country Club, Jamesburg, NJ. Contact: Alliance for Environmental Concerns, P.O. Box 3692, Wayne, NJ 07474; (201) 595-7172.

Professional Lawn Care Association of America Convention and Trade Show, Nov. 14-17, San Antonio (Tx.) Convention Center. Contact: PLCAA, 1221 Johnson Ferry Rd., Suite B-210, Marietta, GA 30067; (404) 977-5222.

LETTERS

Name Change

To the editor:

Congratulations on the name change for WEEDS TREES & TURF. It is a progressive move for the magazine and shows a keen awareness of changes taking place in the commercial market. The expanded, yet clearer title, also reflects your leadership in the development of editorial content for the publication.

Best wishes.

Cheryl A. Van Vliet
Outdoor Power Equipment Institute
Washington, D.C.

G-Max

To the editor:

I read with interest the work on the decelerations experienced by different forms of indentor during impacts with natural and artificial turf ("Safety to the Max," June 1987). As a follow-up to the article, your readers may be interested to hear of research at the Sports Turf Research Institute, Bingley, England, using the Clegg Impact Soil Tester (CIT).

We use the CIT with a 0.5 kg compaction hammer and a drop height of 0.3 meters. This configuration is different from that used by Trey Rogers of Penn State University, an improtant difference as G-Max is responsive to change in hammer weight particularly on layered media, e.g. a sand root zone overlying a gravel drainage layer or on multilayered artificial turf.

As part of a project to investigate standards for natural turf playing fields funded by the Sports Council (London, England), we used the CIT to assess the hardness of natural turf soccer pitches immediately prior to matches. Sixty observations of G-Max were made on each pitch; following the soccer matches, questionnaires were distributed to the players.

G-Max values ranged from about 10 g to 100 g, much higher G-Max values on natural turf soccer pitches have been recorded.

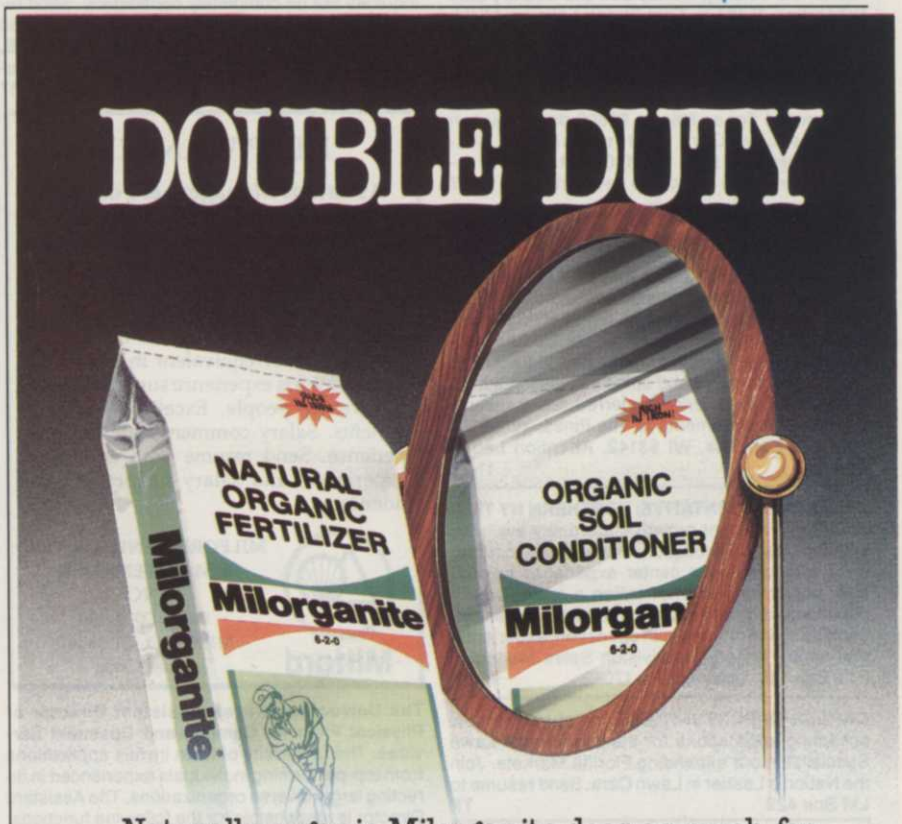
Two questions concerned the hardness of the turf as perceived by the player. The first: "Overall, how did the pitch feel for falling/diving onto?" The results from the 416 respondents show that at G-Max values higher than 60, over 40 percent of the players thought that the surface was either "hard" or "unacceptably hard." The majority thought a G-max of 20-60 was "satisfactory."

The second question: "Overall, how did the pitch feel for running on?" Of the 425 respondents, most considered a natural turf with a G-Max greater than 60 were favoured less and one third of the players who ran on such pitches stated that the surface was "hard" or "unacceptably hard."

There is no evidence to suggest that a soccer pitch with a G-Max greater than 60 is dangerous, but the results do show that British soccer players would prefer not to run, fall or dive onto a surface that hard.

The test of G-max seems to correlate well with the opinion of players and this offers some hope that we may soon have a rapid assessment for the safety factor of playing surfaces.

Graham Holmes
Sports Turf Research Institute
Bingley, West Yorkshire
England



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Milorganite also does great things for the soil. By adding valuable humus, it can actually increase the growing capabilities of all soils. It has been shown to reduce the incidence of disease and build up of harmful thatch.

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BOX NUMBER REPLIES: Mail box number replies to: LANDSCAPE MANAGEMENT, Classified Ad Department, 1 East First St., Duluth, MN 55802. Please include box number in address.

BUSINESS OPPORTUNITIES

LEARN Professional Landscaping and Gardening at home. Accredited program provides thorough training in all phases of commercial and residential landscaping. Certificate awarded. Free booklet describes program and opportunities in detail. Lifetime Career Schools, Dept A-290, 2251 Barry Ave., Los Angeles, CA 90064. 12/87

WANT TO BUY OR SELL a golf course? Exclusively golf course transactions and appraisals. Ask for our catalog. McKay Golf and Country Club Properties, 15485 N. East Street, Lansing, Michigan 48906. Phone (517) 484-7726. TF

Tired of working 12 hours a day for someone else's bottom line? Be your own boss! Earn your own profits! For as little as $6800 down you can join the LawnCare professionals at ServiceMaster. Call (312) 964-1300 ext. 2242 to receive information on how to get started. 12/87

HELP WANTED

LANDSCAPE DESIGNER SALESMAN—Established residential and smaller commercial design/build landscape construction firm, serving southeast Wisconsin and Northern Illinois. Excellent opportunity for aggressive, motivated individual to handle design, sales and some installation supervision. Prior experience preferred. Send resume and salary requirements to The Pines, Inc., 5309 75th St., Kenosha, WI 53142, Attention Leo J. Schuch. 11/87

SALES REPRESENTATIVE: NORTHERN NY TERRITORY - Excellent growth opportunity available with national turf products company. Golf course, lawn care or garden center experience helpful. B.S. preferred, self-motivation a must. Salary commensurate with experience, company car and benefits. Send resume with education, experience and salary history to: Division Sales Manager, P.O. Box 180, Lebanon, PA 17042. 10/87

CAREER OPPORTUNITIES: ChemLawn is now accepting applications for the positions of Lawn Specialist in our expanding Florida Markets. Join the Nation's Leader in Lawn Care. Send resume to LM Box 422. TF

CAREER OPPORTUNITIES

ORKIN LAWN CARE (a division of Rollins, Inc.), is one of the nation's largest and fastest growing Lawn Care Companies. With over 43 branches located in 12 states our expansion plans for FY88 will require more proven management.

We are looking for Branch, District and Region Management talent, as well as, Sales and Service Management employees.

If you are ready to join an aggressive company with over 87 years of service business experience, one that is stable, growing and one where you can build a strong career with unlimited advancement opportunities then send your resume TODAY or call 404-888-2771.

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P.O. Box 647
Atlanta, GA 30301

LANDSCAPE MAINTENANCE FOREMAN—THORNAPPLE LANDSCAPE MAINTENANCE, INC., a fast-growing firm serving commercial accounts throughout the Chicago Metropolitan area, has a career opening for an individual in the landscape maintenance field. Applicants are required to have two to five years "hands on" experience, knowledge of machinery use and maintenance, and technical expertise and knowledge of pests and diseases. A degree in Ornamental Horticulture is desired. **THORNAPPLE** is a well-regarded, quality-oriented firm which will give the right person a challenging career opportunity. All inquiries will be completely confidential. Send resume, work history and salary requirements to **THORNAPPLE LANDSCAPE MAINTENANCE, INC.,** Attn: Mr. Peter Grathoff, P.O. Box 626, Geneva, IL 60134. 11/87

HELP WANTED

Assistant Managers & Foremen

Excellent growth opportunity with Connecticut's largest landscaping firm. Complete Interior and Exterior Construction and Maintenance Departments. Candidates should have an "A.S." or "B.S." in Horticulture or equivalent in experience also two years experience supervising and motivating people. Excellent company benefits. Salary commensurate with experience. Send resume with education, experience, and salary history in confidence to:

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The University of Iowa Assistant Director of Physical Plant for Campus and Custodial Services. The University of Iowa invites applications from top-performing individuals experienced in directing large, diverse organizations. The Assistant Director is responsible for the following functions: Maintenance of more than 400 acres of grounds, custodial services in academic and administrative buildings totaling 5 million gross square feet, Campus Mail Service, and the University's motor pool with a fleet of 350 vehicles. Directs a staff of 300. Requires a Bachelor's degree in business administration, public administration, or industrial engineering; more than five year's experience as a manager; or an equivalent combination of education and experience. Salary is commensurate with qualifications. Forward letter of application with resume to James E. Christenson, Director of Physical Plant, 103 W. Burlington, Iowa City, Iowa 52242. THE UNIVERSITY OF IOWA IS AN EQUAL OPPORTUNITY AFFIRMATIVE ACTION EMPLOYER 10/87

HELP WANTED - PESTICIDE APPLICATOR: Position for trained, educated and experienced Turf and Ornamental Applicator to work with a grounds care corporation. The general scope of the work will include diagnosis and control of insects and disease on bluegrass and ornamental shrubs. We offer excellent benefits and the opportunity to work with imminent professionals. Send resume and salary history. **CARMINE LABRIOLA, INC.,** Providing Horticultural Services to Corporate Landscapes. **200 JOHNSON ROAD, SCARSDALE, NEW YORK 10583.** 10/87

Top Firm Needs Top Person: Quality conscious, Texas based landscape management firm has immediate opening for detail oriented Operations Manager and/or Business Manager. If you have outstanding professional, managerial and horticultural skills and are not afraid of hard and healthy teamwork, then you could qualify for a top position with the finest landscape firm in the southwest. Outstanding compensation and opportunity. Reply today to LM Box 434. 10/87

Landscape Maintenance Crew Foreman - Commercial & Residential Contractor seeks knowledgeable and hard working experienced crew leaders. Excellent career opportunity for responsible, ambitious and self motivated individuals. Horticultural Degree and mechanical ability a plus. Excellent salary, benefits. Send resume to Sharon Adams, Oyler Bros. Company, 1930 Silver Star Rd., Orlando, FL 32804 1-305-295-2921. 10/87

PROJECT MANAGER: Excellent opportunity for career and goal oriented individual to work with a commercial landscape firm in Atlanta, Georgia and Washington, DC. Must be experienced in all aspects of landscape construction and willing to assume total responsibility. Good salary, benefits and incentive program. Scapes, Inc. 404-956-7500. 10/87

Landscape maintenance sales position available in So. California. Sales experience preferred. Send resume/work history to Adco Service Co., 933 So. Greenwood Ave., Suite H, Montebello, CA 90640. 10/87

San Francisco Bay Area landscape firm seeks individual with strong horticultural, irrigation, supervisory, and client relation skills for Landscape Management Supervisor position. Learning and growth opportunities with established company. Salary and benefits. Letter and/or resume to Landscape Care Company, 4026 Pacheco Blvd., Martinez, CA 94553. 12/87

TREE CARE SALESPERSON. Must be knowledgeable in all phases of tree care including pruning, insect and disease diagnosis and control, estimating. Benefits include medical, profit sharing, paid holidays, and vacation. Liberal commission plan. Relocation expenses reimbursed after 6 months. Send resume with salary history to Fairfax Tree Service, Inc., 3746 Chain Bridge Road, Fairfax, VA 22030. (703) 273-7668. 10/87

Seeking manager to develop and expand our maintenance department, demonstrable experience in the areas of maintenance sales and production required. Expect first year sales of $300,000, and be willing to base salary upon sales and production. Seeking individual who is willing to believe in himself, perform, and be paid handsomely for his initiative. AYS Landscape Company, 31 W. 545 Diehl Road, Naperville, IL 60540, (312)983-0094. 12/87

Lawn Care and Lawn Maintenance Assistant Manager: Leading Horticultural Company since 1929 is seeking qualified applicant who is highly motivated, management oriented and strong in customer sales and service. Excellent growth opportunity and benefits. Salary commensurates with experience and performance. Send resume to: McNaughton's Nurseries, Inc., 351 Kresson Road, Cherry Hill, NJ 08034. 10/87

TREE CARE SALESPERSON - B.S. degree preferred in Urban forestry, horticulture or related field. Knowledgeable in pruning and fertilization of trees, disease and insect control. 1-2 years experience necessary. Benefits include Medical Plan, Profit-sharing, and paid vacation. Relocation reimbursed after 6 months employment. Send resume with pay history to Ira Wickes - Arborists, 11 McNamara Road, Spring Valley, NY 10977, 914-354-3400. 12/87

HELP WANTED

Growing Landscape firm, located in Southwestern U.S. has openings for qualified Operations Director responsible for all landscape installation projects and qualified Maintenance Superintendent. Require minimum of 7 yrs. Commercial Landscaping installation, and/or Maintenance Management, and outstanding supervisory skills. Degree in Landscaping or related field desirable. Salary and benefits commensurate with experience. Send resume and salary needs to LM Box 435. 11/87

Wanted - Manufacturers rep with successful sales force to sell turf spraying line. 38 years old Midwestern manufacturer of agricultural sprayers is expanding to turf industry and needs manufacturers rep for sales support. Opportunity for the right firm to have input into product line. Send organizational information to: Jim Weaver, V.P. Sales, Kuker Industries, Inc. Box 37589, Omaha, NE 68137. 10/87

HELP WANTED: Landscape, turf and spray foremen, nurserymen and pruners. Experience and/or education necessary to work for our dynamic, quality oriented, large, 40 year established company in the Hamptons on Long Island. Professional wages and benefits, year round, full time positions. Contact: Whitmore-Worsley Inc., P.O. Box 10, Amagansett, NY 11930. (516)267-3756. 12/87

LANDSCAPE MAINTENANCE SUPERVISOR: Expanding landscape management firm seeking individual with supervisory ability and a minimum of two years experience in maintenance and/or installation. An agricultural related background or degree would be beneficial. Send resume with salary requirements to: Maintain Inc., 16008 Boss Gaston, Richmond, TX 77469, Attn: Branch Manager. 10/87

Equipment for the turf care professional. **Olathe**

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☐ San Diego ☐ San Jose ☐ Colorado Springs ☐ Denver
☐ Phoenix ☐ Houston

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Environmental Care Inc
Landscape Maintenance Services
A subsidiary of environmental industries, inc.

Personnel Department
24121 Ventura Boulevard
Calabasas, CA 91302

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HELP WANTED

LANDSCAPE HORTICULTURAL POSITION

We have an immediate position available for a landscape working foreman with knowledge and experience in leading and working with a crew. Job responsibilities include installation, replacement of trees, plant material, sod, etc. Other duties include pruning trees and shrubs, plowing snow, and general landscaping work. Knowledge of landscape construction helpful. We are located in Dearborn, MI and have over 40 commercial sites in the Ford Motor land development corporation development. This is a year-round position with excellent health benefits, paid holidays, and paid vacation. We also have excellent equipment and working conditions - the best in the industry! For more information please call Bob or Terry 313-337-2591. If no one is available please leave message and we'll get back to you as soon as possible!!

Landscape Architects/Supervisors (project foremen) to join a nationally acclaimed firm looking to expand into its second generation Long Island area supports a high budget landscape industry. Year round employment, company benefits and continuing education available. Experienced and aggressive people send resume to: **GOLDBERG & RODLER, INC.**, 216 East Main Street, Huntington, New York 11743. 10/87

TECHNICAL SERVICE REPRESENTATIVE- Excellent opportunity for career and goal oriented individual to work with a commercial landscape firm in Mid-Atlantic state. Must be experienced in all aspects of landscape construction. Requires BS or AS degrees in agronomy, horticulture or turf management. Salary, incentive, and profit sharing program. Send your resume with a recent photograph and salary history to LM Box 439. Position available January 1, 1988. 10/87

GIBBS LANDSCAPE COMPANY - Landscape and grounds maintenance. High caliber people needed to assist award winning company doing quality work in Atlanta area. Must have good driving record, and transportation. Offer good pay, and benefits. If you are dependable and industrious, send resume: Attn: Mike Sherman, 4111 Burge Road, Smyrna, GA 30080. (404) 432-7761. 11/87

GROUNDS SERVICE SUPERINTENDENT up to $2,901 approx. monthly (plus an extensive benefits package). San Bernardino County is recruiting for a Grounds Services Superintendent who will be responsible for directing, planning, designing and supervising the landscaping and maintenance of grounds and gardens adjacent to County facilities. One year of experience in managing and supervising a large landscaping and maintenance operation in a governmental, industrial or business environment is required. In addition, 24 semester (36 quarter) units of completed college level coursework in landscape, design and/or horticulture is also required. San Bernardino County is located in sunny Southern California approximately 60 miles southeast of Los Angeles. Qualified applicants should apply by October 30,1987 at San Bernardino County Personnel Office, 157 West 5th Street, San Bernardino, CA 92415 (714/387-5591/8304). 10/87

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This position will have P/L responsibility for the management of a warehouse operation serving the professional lawn care industry; including local sales development, inventory control and accounts receivable. Ideal candidates should have previous experience in the lawn care and/or golf course industry, or possess a horticultural background. Past selling experience helpful.

Positions are available in various Florida markets and also Long Island, Philadelphia, Washington, and Baltimore.

Our firm has an established growth pattern and record of profit sharing. Interested and qualified candidates should submit resume and salary history in confidence to:

Brad Gerson
LESCO, INC.
20005 Lake Road
Rocky River, OH 44116
Equal Opportunity Employer

LANDSCAPE DESIGNER AND ESTIMATOR. Design/build landscape construction firm is seeking an experienced designer and estimator. Must be able to handle the job from sales to completion of job. Must have good graphic ability. Salary and benefits commensurate with ability and experience. Send resume to: P.O. Box 725, Utica, MI 48087. 10/87

LANDSCAPE MAINTENANCE AND CONSTRUCTION FOREMEN: Suburban Cleveland firm is seeking experienced individuals who can work together with other people. Must be hard working, organized and capable of directing a project from beginning to end. Salary commensurate with experience. Send resume to: P.O. Box 391002, Solon, OH 44139. 10/87

MANAGEMENT: Ever-Green Lawns Corporation, a division of the multi-national Hawley Group, Ltd. is looking for experienced lawn and tree care professionals. Please respond in writing only to Richard D. Niemann, Corporate Recruiter, Ever-Green Lawns Corp., 1390 Charlestown Industrial Drive, St. Charles, MO 63303. TF

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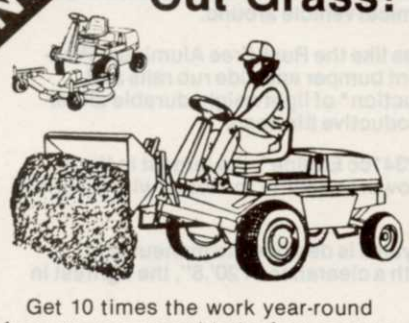

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Circle No. 129 on Reader Inquiry Card

Managing to get ahead

We took a new name a few months ago, believing that the bulk of our readers are, indeed, "managers." Managers of their time, managers of budgets, project managers and people managers. When a good manager speaks, people listen.

Ron Kujawa is such a person. He not only operates a thriving business in the Milwaukee area, but he's also a very active member of the Associated Landscape Contractors of America and a member of *Lawn Care Industry*'s technical advisory board.

Kujawa spoke at the most recent Landscape Expo, and people listened.

"A certain amount of caring and consideration is necessary to be a good manager and recognize employees' problems," he noted. "Employees have personal goals. We want them all to achieve those goals, using the company as an avenue. And, in most of the cases, their goals are the same as yours: coping with challenges, economic security and so on."

Kujawa, who operates KEI Enterprises with wife Sally, has three simple rules for its managers:

(1) "You must be honest and represent the company with integrity.

(2) "You must never promise what you cannot deliver," and, Kujawa says with a laugh,

(3) "Ronnie and Sally do not like surprises."

Employees have told the Kujawas what their immediate needs are. Everytime they ask, they hear the same refrain: communication, recognition and training.

These are not big secrets here. Every good manager knows that he or she must communicate with employees. Employees don't like surprises, either. Every good manager knows that he or she must recognize exceptional efforts by employees. It helps them recreate that effort when needed again if they know it will be appreciated. And every employee would like to be taught the best, safest way to finish an assigned task.

Most of all, as Kujawa never ceases to point out, managing is a 24-hour-a-day job. Are you up to the task?

Jerry Roche

Jerry Roche, editor

Questions and comments are encouraged.
Write or call editor Jerry Roche:
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